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ABSTRACT

In this field study, black and white naval recruits and squad leaders in groups of varying size and racial composition performed two problem-solving tasks (knot-tying and ship-routing). Black and white leaders, subordinates and group composition (25% black tetrads, 75% black tetrads, racially balanced dyads and tetrads) were compared in measures of self-esteem, duration of speech, locus of control, job and general satisfaction, Bales IPA behavior, and performance on the tasks. Leader, group, and interaction effects were found between leaders and group types. For the know-tying task, groups supervised by black leaders displayed less agreeing, less asking for information, less asking for opinion, and more antagonism than white supervised groups. For the ship-routing task, groups supervised by black leaders displayed less asking for opinion but more asking for information and duration of speech than white supervised groups. No differences were found between black and white leaders in consideration and initiating structure as perceived by leaders and their subordiantes. As expected, white subordinates preferred white leaders while black subordinates under black leaders identified their leader as best. Although black leaders expressed higher aspirations, expectancy of success was lower for blacks than whites. Few differences were found in role performance among the leaders. (Author)

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

A Field Study involving 288, 224 black and white, naval recruits and 64 squad leaders in groups of varying size and racial composition performed two problem-solving tasks (knot-tying and ship-routing). Black and white leaders, subordinates and group types (25% black tetrads, 75% black tetrads, racially balanced dyads and tetrads) were compared in measures of self-esteem, duration of speech, locus of control, job and general satisfaction, Bales IPA behavior, and performance on the tasks. Leader, group, and interaction effects were

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ATTITUDE DIFFERENCES AND TASK PERFORMANCE FOR BLACK AND WHITE NAVAL RECRUITS IN PROBLEM-SOLVING GROUPS OF DIFFERING SIZE AND RACIAL COMPOSITION

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Technical Report No. 75-1

October, 1975

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INTRODUCTION

Today, as in the past, many qualified blacks are being denied better jobs in military or civilian work because of the assumption that blacks are different from whites in a variety of work attitudes and behaviors that reduce group performance. Although several studies have compared racial differences for a large number of variables (Edwards, 1974; Miller & Dreger, 1973; Hess, 1970; Dreger & Miller, 1968; Shuey, 1966), most focused on personality traits, intelligence or other abilities. Few empirical studies have examined the differences and effects of these differences in various work group environments. The lack of social psychological research considering differences between blacks and whites has been decried by many authors, (Triandis & Malpass, 1971; King & Bass, 1974; Dreger & Miller, 1968; Moskos, 1967).

Earlier comparative research was concerned primarily with attempts to measure and describe interracial deviations. This work was done within a normative framework where the behavior of whites served as a norm from which black behavior or attitudes was evaluated. Social psychological research was concerned primarily with the response of whites to blacks.

Ford (1975) in a recent book contends that race is an important factor in the work culture that particularly effects organizational functioning. As early as 1959 Ginzberg identifies race as one of the determinants of group effectiveness in the military. However, only recently has this relationship been studied in various

organizational settings, e.g. race related research (Katz, 1970); racial differences in satisfaction, reenlistment intentions, illness and accident rates aboard Navy ships (Jones, James & Bruni, 1975); racial differences in organizational preferences, practices, and felt discrimination in the Navy (Parker, 1974); leadership differences between black and white supervisors and subordinates (Hill, Allen, & Ruhe, 1975; Hill & Allen, 1974; Hill & Ruhe, 1974; Parker, 1972; King & Bass, 1974; Richards & Jaffee, 1972); racial differences in homogenous and heterogenous work groups (Hill & Ruhe, 1972; Oslin, 1974); racial attitudes in army life (Borus, Stanton, Fiman, & Dowd, 1972); leader's perceptions of racially different squads (Hill, Fox, & Ruhe, 1972); racial differences or generalizations about race and felt discrimination in the Navy (Stoloff, Lockman, Albritton & McKinley, 1972); job attitudes in industry (Smith, Smith, & Rollo, 1974; Gavin & Ewen, 1974; O'Reilly & Robert, 1973; Milutinovich, 1971; Katzell, Ewen, & Korman, 1974), need fulfillment (Slocum & Strauser, 1972).

The results of these studies generally suggest that differences, especially between black and white subgroups, can be attributed to a number of causes, among them being (1) the racial composition of work groups, (2) the differences in leadership practices, (3) the degree of racial discrimination, (4) race-related cultural differences, and (5) the prevailing organizational climate.

The principle purpose of this report is to complete the examination of data gathered in a field experiment investigating racially heterogeneous groups of varying size and racial composition under the supervision of black and white leaders. A previous report (Hill & Allen, 1974) examined the effects of changing group size and composition on the attitudes, behaviors, and effectiveness of the black and white leaders in this study. The present report is the next to last one in a series which has been examining differences in the attitudes, behaviors, and effectiveness of racially mixed, problem-solving groups under the supervision of black and white leaders in university and military environments (Hill & Allen, 1974; Hill & Ruhe, 1973; Hill, Ruhe & Allen, 1973; Ruhe & Hill, 1973; Ruhe & Hill, 1972; Hill & Ruhe, 1972). A subsequent and final report in this series will examine differences in black and white leaders' and subordinates' attitudes and behaviors and in group effectiveness by combining and comparing the data from both the laboratory experiment conducted in a university setting using students as subjects and the field experiment conducted in a military setting using naval recruit a subjects.

LITERATURE REVIEW

Leadership, as a field of interest, can be viewed as a social exchange process. The essence of social exchange is the development of relationships with other persons, such that benefits of mutual value can be "traded" between participants of both equal and unequal status (Jacobs, 1970). Implicit in this exchange or transactional approach is the understanding that indivudual, situational, and cultural differences have the potential of impinging upon the leadership process and influencing or moderating any variables associated therewith. The review of the literature that follows focuses mostly on those differential attributes which have been found between blacks and whites and on other substantive considerations which, collectively, may shed some light on possible differences in leadership behavior viewed within the context of the transactional approach. The review is grouped under the following sub-headings: Interracial Attraction, Biracial Work Groups, Leadership Studies, Job Satisfaction, Self-Concept, Locus of Control, Intelligence and Aptitude, and Miscellaneous Related Research.

Interracial Attraction

Important questions which arise in racially-mixed work groups are: what attitudes the members hold toward each other, and will there be attitude change should positive attitudes not exist before formation of the work group? Answers to these questions can be important determinants of intergroup cooperation toward joint goals and communication so vital to group effectiveness.

Contact studies provide the most solid psychological evidence of racial attitude change (Pettigrew, 1969). Although exceptions have been found (Carithers, 1970; Mussen, 1950; Shaw, 1970; Wertzer, 1971; Yarrow, 1958; Zuel & Humphrey, 1971), numerous other studies have shown that interracial attractiveness increases with increased contact between blacks and whites in such diverse situations as public housing projects (Deutch & Collins, 1951; Jahoda & West, 1951; Wilner, Walkley, & Cook, 1955; Works, 1961), military service (MacKenzie, 1948; Stouffer et al., 1949), department stores (Harding & Hogrefe, 1952; Saenger & Gilbert, 1950), university settings (Allport & Kramer, 1946; MacKenzie, 1948; Mann, 1959), a meat-packing plant (Palmore, 1955), the merchant marine (Brophy, 1946), government organizations (MacKenzie, 1948), the police (Kephart, 1957), public schools (Williams & Ryan, 1954), and general small town populations (Williams, 1964). On a national scale, contact findings supporting positive racial attitude change are also in evidence (Coleman et al., 1966; Hyman & Sheatsley, 1964: U. S. Commision on Civil Rights, 1967).

In a Navy related study of officers and men at the Great Lakes Naval Center and Naval War College, Stoloff, Lockman, Albritton, & MacKinley (1972) found white enlisted men subscribed more to racial generalizations and stereotyped ideas about non-whites. Blacks clearly perceived the most discrimination. Unfortunately, this research did not measure any change in attitude with the contact increase.

Many investigations suggest that contact per se is the only explanation of attitude change; however, some of the results can be interpreted not to result from contact but from the fact that more tolerant whites may seek contact with blacks. Indeed, interracial attraction has also been reported as increasing due to social reward such as perception of attitude similarity (Byrne & McGraw, 1964; Byrne & Wong, 1962), rewards which can occur only as a consequence of interaction (Fromkin, Klimoski, & Flanagan, 1972), and judgmental support in an Asch conformity situation (Malof & Lott, 1962). Amir (1969) found that the integration process is facilitated (a) when there is equal status contact between members of the two groups, (b) when the contact is between members of a majority group and higher status members of a minority group, and (c) when an "authority" and/or the social climate favor and promote intergroup contact.

Although the work of Triandis and his colleagues (Triandis, 1961: Triandis & Davis, 1965; Triandis, Loh, & Levin, 1960) has

generally found race to be the strongest variable in determining attraction, it may not be very important at all in face-to-face interaction (Hendrick, Bixenstine, & Hawkins, 1971). Relative to race other more powerful determinants have been found; similarity-dissimilarity in beliefs (see, e.g. Hendrick & Hawkins, 1969; Hendrick, Bixenstine, & Hawkins, 1971; Insko & Robinson, 1967; Smith, Williams, & Willis, 1967; Stein, 1966; Stein, Hardyck & Smith, 1965), and the social class variable (Bayton, McAlister, & Hamer, 1965; Terry & Evans, 1972).

From the foregoing we must conclude, as others have (Campbell & Yarrow, 1958; Gundlach, 1956; Proshansky, 1966), that mere contact is a necessary but insufficient condition for positive racial attitude change. Further contact-type studies must pay attention to other determinants such as social setting, status hierarchy, belief similarity, and social class.

Biracial Work Groups

The behavior displayed in biracial work groups and problem-solving situations may be suggestive of how blacks and whites might compare during the social exchange process. Blacks have displayed marked social inhibition and subordination to white partners in cooperative problem-solving situations, even when both races were matched on intelligence and made to display equal ability at the task; blacks mostly ignored one another, made fewer proposals, were

less willing to argue for their point of view, were more susceptible to group influence, ranked whites higher on mental ability, favored whites when talking, favored one another as future work companions, and expressed less satisfaction with group experiences than did whites (Cohen, 1972; Katz & Benjamin, 1960; Katz, Goldston, & Benjamin, 1958).

Although some studies suggest that blacks alter their behavior in an unfavorable direction or decrease in performance efficiency when faced with a white frame of reference as compared to a black frame of reference (Hatton, 1965; Katz & Cohen, 1962; Katz, Epps, & Axelson, 1964; Katz, Roberts, & Robinson, 1965; Preston & Bayton, 1941), others suggest improved performance in the white norm condition (Epps, Katz, & Runyon, 1970; Katz, Epps, & Perry, 1970; Katz et al., 1972).

Some of the work done by Katz and his colleagues has the race of the experimenter as one of the major variables and these provide results relevant to this study. Under a low stress condition blacks worked better in an all-white environment; however, under a high stress condition black effeciency improved in the all-black environment and went down in the all-white environment (Katz & Greenbaum, 1963). These results were interpreted in terms of the hypothesis of an inverted U-shaped relationship between arousal and performance (cf., Malmo, 1957; Duffy, 1957), with the low stress, all-black environment considered insufficiently arousing for optimal performance

and the high stress, all-white environment too arousing, since the blacks worked best in a low stress, all-white enviroment. In another study (Katz, Roberts, & Robinson, 1965), relating the most difficult task level to intelligence reduced black performance under a white experimenter, but when the same task level was described as a test of eye-hand coordination (i.e., an ability which blacks are not stereotyped as lacking), black performance was better with a white experimenter than with a black experimenter. These results were related to the concept of task motivation as a joint function of the subjective probability and incentive value of success (cf., Atkinson, 1964); thus, when the likelihood of winning approval was equally high, blacks would work harder for a white person (i.e., a higher status individual) than a black person.

Actual white behavior in the biracial situation has not been studied to the same degree as black behavior. Burnstein & McRae (1962) investigated the attitudinal effect of participation in biracial problem-solving groups and found that under conditions of shared threat a reduction in the expression of prejudice occurred, although communication to the black participants was significantly less by the high prejudiced white subjects, regardless of the presence or absence of shared threat. Whites also evaluated a black partner more favorably when groups received failure feedback than after success feedback. Another study (Katz, Goldston, & Benjamin, 1958) found that group reward produced a greater amount

of cooperative behavior in both black and white subjects. Other differences in behavior were found attributable to the prestige of the group. Although no more likely to have correct solutions than blacks in group problem-solving, whites still exercised more social influence (Katz & Benjamin, 1960; Katz, Goldston, & Benjamin, 1958). When talking, whites have favored whites as the target of their inter-interaction (Cohen, 1972; Katz & Benjamin, 1960; Katz, Goldston, & Benjamin, 1958). While in one study (Katz, Goldston, & Benjamin, 1958) whites chose blacks as often as they chose one another as future working companions and ranked blacks as high as themselves on task competence, in another (Katz & Cohen, 1962) experimental whites downgraded the problem-solving ability of black partners, even though they were correct, and expressed less willingness to continue working with the blacks, as compared to control whites. Blacks were found to be more likely to persist in task situations in which they expected their behavior could determine the occurrence of reinforcements they held in high value (Lefcourt & Ludwig, 1965).

A more recent study involving members of cooperating interracial groups in the military (Blanchard, Adelman, & Cook, 1975) found that the degree of liking and respect was influenced by the success or failure of the group in achieving its goal. No differences were found between black and white group members. Hill & Ruhe (1972) also found no differences between homogeneous black, homogeneous white and heterogeneous groups in cohesiveness, group productivity,

or the amount of conflict and satisfaction expressed. Differences were found only within heterogeneous dyads. Black subordinates as compared to white subordinates exhibited:

(a) less giving of suggestions with a white supervisor
(b) less giving of information
(c) lower duration of speech
(d) higher self-esteem
(e) greater satisfaction with work in the tasks.

However, it appeared that none of the above differences adversely affected group productivity. Another study (Oslin, 1974) found no difference between accuracy of decision making of heterogeneous and homogeneous groups.

From these studies we can reach several plausible conclusions. Black performance probably depends upon the racial-environmental conditions under which they must work. Anticipation of a cross-racial comparison may have a favorable motivational effect. Members of both races may favor white recipients when talking, ostensibly because whites are perceived as having higher social status. Whites may be more influential in biracial group decisions, and blacks are probably more susceptible to group influence. Rokeach & Mezer (1973) conclude that in real life experiments, congeniality of ideas prove to be a stronger determinant than race. The reaction of whites to blacks in the biracial problem-solving situation remains equivocal.

Leadership Studies

An important consideration is the functioning of blacks in leadership positions and their acceptance by whites as leaders. Support for a proposal that whites in the job setting would be willing to have blacks over them in a position of leadership and supervision can be found in Campbell (1971), where 86 percent of the white respondents to a 15-city survey said they would not mind at all having a qualified black as a supervisor on their job, and Cavanaugh (1970), who found that whites accepted a black supervisor more readily than did many of the blacks.

Using the Leadership Behavior Description Questionnaire Glasgow (1970) found no significant differences between the initiating structure and consideration scores of a sample of black public school principals and those of a sample of white principals taken from a previous study. Glasgow points out that black principals see themselves as being competent to assume the leadership role in professionally staffed organizations.

Leadership assumption in a simulated clerical task was investigated by Fenelon and Megargee (1971). The rate of leadership assumption by high-dominance white women paired with low-dominance black women was significantly lower than the rate of leadership assumption by both black and white high-dominance women in the other groups. Analysis of the process for deciding who should assume leadership suggested that the above finding stemmed from the reluctance of the

high-dominance white women to assume leadership over the low-dominance black women coupled with the increased assertivness of low-dominance black women when paired with a white partner.

Using a business game to investigate interracial difficulties of blacks and whites working together when blacks are in a supervisory position, Richards & Jaffee (1972) found that the performance ratings by white observers of black supervisors were significantly poorer than those of white supervisors; that subordinates supervised by blacks behaved differently than subordinates supervised by whites, and some of these behaviors appeared to hinder the effectiveness of the black supervisor; and that subordinates with negative racial bias gave poorer ratings to black supervisors than subordinates with more liberal racial attitudes. Richards & Jaffee (1972) also identified possible racial biases of the white observers affected the performance evaluations of black supervisors.

Observing self-analytic interracial study groups Winter (1971) found some common basic patterns of role relationships in these groups, most notably the emergence and recruitment of the most active black male as the unquestioned group leader and the development of stable reactions to his leadership role by the other group members. Members acknowledged this leadership in group discussions and each of the black leaders received the greatest number of nominations as the most influential member within his group.

In a seven-month longitudinal study of Marine Corps squads, Hill, Fox, & Ruhe (1972) found that white squad leaders gave proportionately

more reprimands and praise to their white subordinates, but gave proportionately better performance ratings to their black subordinates. The authors concluded that squad leaders of both races may "go out of their way" to make their relations with subordinates of a different race appear nondiscriminatory.

Parker (1972) in an industrial study found that the race of subordinates and the racial composition of work groups on specific leadership measures were critical variables in subordinate-supervisor relations. Similar race subordinates rated their supervisor more favorably on the Managerial Support dimension of leadership. Only among white subordinates in a minority numerical position within the work groups with white supervisors did the supervisors receive more favorable rankings on three of the managerial leadership measures (Managerial Goal Emphasis, Work Facilitation, and Interaction Facilitation). Black supervisors were ranked more favorably than white supervisors on 3 of the 4 measures (Managerial Support, Goal Emphasis, and Work Facilitation). Parker concluded that the behavior of supervisors toward their subordinates is a complex function of (a) the supervisor's own race and role in combination with (b) the race of subordinates, and the majority or minority numerical positions of racial groups within the group supervised.

In a laboratory (Ruhe, 1972) involving black and white suudents leading homogeneous black, homogeneous white, and heterogeneous dyads of fellow students, no differences were found between black and white leaders in their duration of speech, expressed self-esteem, satisfaction

with their subordinates or the tasks they supervised, and in the productivity of their groups. White leaders were observed to emit more comments classified as asking for opinions and suggestions than black leaders. Although leaders were found to vary their leadership style, these variations were traced to differing task demands rather the leader's race (Hill & Ruhe, 1974). This laboratory study was followed by a field study involving black and white squad leaders leading racially balanced dyads and tetrads, 25 percent and 75 percent tetrads. (Hill & Allen, 1974). The results obtained in the dyads tended to corroborate findings of the earlier laboratory experiment which indicated few differences between black and white leaders. The resluts of the field experiment itself, however, revealed leader effects, group effects, and interaction effects between leader and group types. More specifically, white leaders were seen as more frequently using some of the Bales IPA catagories and as feeling more internal control than black leaders. White led groups also performed better than black led ones. All leaders were observed to use some of the IPA categories less frequently with the racially-balanced dyads than with the racially-balanced tetrads (size effect) and to use such comments less frequently as the percent of blacks in the tetrads incresed from 25 to 75 percent (composition effect). Between leader within group type interactions revealed that black leaders used directive comments less frequently than their white counterparts while supervising tetrads in the performance of the knot tying task. Between group within leader type interactions revealed more significant differences within black

than within white leaders. Such differences generally showed less behavior activity as the groups increased in size and in their percent of black subordinates. No differences were discovered in measures of self-esteem and satisfaction with either task or subordinates.

Since the combination of these studies fails to provide any recurring theme, conslusions must be advanced cautiously. Perhaps the best conclusion that can be reached is that the evidence fails to demonstrate abject deficiencies for blacks in positions of leadership. It is interesting to note that no differences were found on the two leadership traits initiating structure and consideration, and that it is possible for a black leader to emerge from the interracial group situation. Also, it appears that whites are receptive to blacks as a superordinate.

Job Satisfaction

The satisfaction and attitudes found while blacks and whites are in actual job situations may be indicative of any differences in the assets available during any transactional leadership process.

Depending on the demographic stratum to which they belong, blacks may have higher, the same, or lower job satisfaction than whites (Feldman, 1972; Kahl & Goering, 1971; Katzell, Ewen, & Korman, 1974; Milutinovich, 1971). Although black job attitudes less favorable than those of whites have been found (Katzell, Ewen & Korman, 1974), the evidence heavily favors the conclusion that black workers have job attitudes as favorable or even more favorable than those of whites (Feldman, 1972; Katzell, Ewen, & Korman, 1974; Nelson, Achabel, & George, 1971).

Investigating the relationship of race and job satisfaction and the influence of participative and authoritative supervisory styles on the job satisfaction of blacks and whites, Milutinovich (1971) found that race has only limited influence on job satisfaction, and that both blacks and whites had higher job satisfaction under participative than under authoritative supervision. Black blue- and white-collar workers had similar job satisfaction, while white blue-collar workers were lower than white white-collar workers. Blacks, regardless of job type, had higher job satisfaction than white blue-collar workers, but had lower satisfaction than white white-collar workers.

In an extensive exploratory study of hardcore unemployed blacks and whites and working-class blacks and whites, Feldman (1972) found that black subjects evaluated several material and social job outcomes more highly than whites, and black working-class subjects rated a variety of outcomes, including some higher order ones (Maslow, 1954), more highly than any other group. He summarized his general pattern of results as suggesting that the black subjects, particularly the working-class, perceive work as a source of valued rewards, while the white working-class does not.

Examining whether intrinsic and extrinsic job factors vary as a function of race in the accounting profession, Slocum & Strawser (1972) found that black CPAs reported higher need deficiencies in 11 of the 13 need items of Porter's (1961) questionnaire, six being statistically significant: opportunity to help people, opportunity for friendship, feeling of self-esteem, opportunity for growth and development, and

compensation. Black CPAs were less satisfied in the social need category and indicated that the esteem and autonomy needs were more satisfied than the social and security needs. In both the black and white groups, the self-actualization and compensation needs were the most deficient. In a more recent study of newly hired college graduates Alper (1975) found that both blacks and whites rated growth characteristics as most important in their jobs, but blacks rated each extrinsic item higher.

Generalizaing from these results, we can conclude that the satisfaction and attitudes of blacks on the job are essentially equivalent to or even more favorable than those of whites, recognizing the moderating effect of the class variable.

Self-Concept

As Jacobs (1970) has noted, it is important to the individual that his self-concept be as favorable as possible; the more favorable it is, the greater will be his assets in social exchange relationships. Although Morris (1975); Healey & DeBlassic (1974); Coleman et al., (1966) found no difference in the self-concept of blacks and whites in the educational setting, many studies of blacks suggest the presence of an unfavorable self-image (Hodgkins & Strankenas, 1969). Society has fostered a negative self-concept among blacks by nuturing and rewarding feelings of inferiority and unworthiness (Poussaint & Atkinson, 1968), and this sort of self-image may account for such behavior as black

parents favoring a light-skinned child (Coles, 1967; Grambs, 1964), dark-skinned men trying to marry wives of a lighter skin color (Kardiner & Ovesey, 1962), and the tendency of the black child to identify with the white majority (Clark & Clark, 1947; Goodman, 1952; Landreth & Johnson, 1953; Morland, 1962; Radke & Trager, 1950; Stevenson & Stewart, 1958). Considerable research supports the contention that blacks almost inevitably develop feelings of low self-esteem (Ausubel & Ausubel, 1963; Bernard, 1958; Bridgette,1970; Clark, 1967; Guggenheim, 1969; Jefferson, 1957).

The "black is beautiful" theme, however, that emerged during the 1960's, raises serious doubts as to the validity of many of these earlier studies. Indeed, recent research does indicate an improved self-image among blacks, often equalling or exceeding that of whites (Bach & Parmesh, 1969; Carperter & Busse, 1969; Dennis, 1968; Douglas, 1970; Greenwald & Oppenheim, 1968; Hodgkins & Strakenas, 1969; Hraba & Grant, 1970; McElroy, 1971; Ogletree, 1969; Ruhe, 1972; White, 1971).

A careful examination of the literature leads one to the conclusion that variables such as social setting (Ausubel, 1958; Coleman et al., 1966; Hodgkins & Strakenaus, 1969; Ruhe, 1972), social class (Butler, 1973), sex (Carpenter & Busse, 1969), sex of the experimenter (Kirn, 1974) age (Clark & Clark, 1947; Morland, 1962; Proshansky & Newton, 1968; Radke & Trager, 1950) parental racial attitude and racial milieu (Smith, 1975) are moderating variables in the determination of self-concepts. Therefore, it is an over simplification to generalize and say that black self-concepts are necessarily deficient when compared to

white self-concepts. Markovics (1974) concluded that some of previous research may have been misleading because of the instruments used.

In a recent review concerning self-concept and attitudes, and covering generally the late 1960's, Christmas (1973) found that the research surveyed fell into three major categories, which corroborate the importance of moderating variables on self-concept:

> The first was concerned with the influence of antecedent factors upon current aspects of self-concept. In these studies, self-concept was the inferred consequent of familial, parent-child, or other social interaction; of counseling, guidance or role modeling; or of variations in learning experience or educational practice (Allen, 1969; Crovetto, 1968; Crovetto, Fischer, & Boudreaux, 1967; Henderson, 1967; Talley, 1968). A number of investigations explored the possible effects of integrated, desegregated, and segregated schooling on self-attitudes (Bass, 1969; Bienvenu, 1968; McWhirt, 1967; Strauss, 1967; Taylor, 1968). The findings were generally inconclusive.
>
> The second major group included studies in which antecedent self-concept was presumably related to behavior. They included investigations of self-evaluation and self-esteem (Guggenheim, 1969; Soares & Soares, 1969; Williams & Byars, 1969, 1970); differences between blacks and whites in regard to ethnocentrism and self-acceptance (Freeman et al., 1966; Getter & Satow, 1969; Greenwald & Oppenheim, 1968; Hraba & Grant, 1970); and studies of level-of-aspiration performance in learning tasks and academic achievement (Blair, 1972: Caplin, 1966,1969; Curtis, 1967; Freyberg & Shapiro, 1966; Gay, 1966; Greenberg et al., 1965; Lourenso, Greenberg & Davidson, 1965). Here, too, results were inconclusive and failed to show a definite relationship between self-concept, broadly defined, and behavior.
>
> Finally, a number of research efforts were directed toward determining possible correlations between self-esteem and variables such as occupational level, socioeconomic status, residence, age, and sex, in blacks and whites (McDonald & Gynther, 1965; Wendland, 1969; Wylie & Hutchins, 1967; Yeatts, 1968). Here, at least, recognition was given to the possibility, for example, that socioeconomic status might outweigh the factor of race. Yet, several investigators still compared blacks of lower socioeconomic status with middle class whites, while acknowledging this to be a limitation of the study (Long & Henderson, 1968). The weakness of the design and the methods of data analysis in these studies contributed to the resultant lack of solidity in the findings.

Considering these findings on self-concept as a whole there seems to be good reason to believe that differences in that part of leadership or subordinate behavior which may be influenced by self-concept may not exist to any significant degree between blacks and whites in similar situations because of these various moderating variables.

Locus of Control

It is often stated that locus of control is an important determinant of individual behavior, hence, one possible way of explaining differences in behavior between black and white supervisors may be locus of control. For example, two review articles (Lefcourt, 1966; Rotter, 1966) have shown that when a person believes that reinforcements are controlled by internal rather than external forces, he is likely to make greater attempts at mastering the environment; to be more resistant to influence attempts by others, yet more effective in attempts to influence others; to prefer high-probability choices in risk-taking behavior; to be lower in anxiety and higher in achievement orientation; to act more responsively to probability changes in the situation; to place higher value on skill-determined rewards; and to be involved in social action (Lao, 1970). Also, internals are more active in intellectual pursuits and show greater interest in intellectual activities (Crandall, Katkovsy, & Crandall, 1965; Crandall, Katkovsy, & Preston, 1962).

The research relating to this dimension in groups of blacks and whites has consistently demonstrated class and racial differences

(see, e.g., Lao, 1970; Lefcourt, 1965; Lefcourt & Ladwig, 1965b), with a sense of internal control being stronger in the middle class than in the working class and stronger in whites than in blacks (Battle & Rotter, 1963; Coleman et al., 1966; Crandall, Katkovsky, & Crandall, 1965; Gurin, 1970; Lefcourt & Ladwig, 1965a). The interaction of class and race is such that lower class blacks stand out as having a particularly external orientation (Battle & Rotter, 1963; Coleman et al., 1966; Lefcourt & Ladwig, 1965a). However, Greenhaus & Gavin, (1972) found that blacks did not feel the relative powerlessness and external control indicated earlier.

While one study did find no differences between blacks and whites in locus of control (Hall, 1969), and even though blacks in one situation behaved in a more cautious, internal fashion than did whites (Lefcourt, 1965), blacks as a group seem to feel and behave as if they have limited control of reinforcement, however, as Miller & Dreger (1968) suggest, this reaction may relate to the type of situation being studied. Higher achievement scores and grades, greater academic confidence, and higher expectations and aspirations have been reported on the part of the black students with a strong feeling of personal control (Gurin et al., 1969; Lao, 1970). In contrast to studies using general locus of control measures, those using the Intellectual Achievement Responsibility scale (Crandall, Katkovsky, & Crandall, 1965) report no race effects (Katz, 1967; Solomon, Houlihan, & Parelius, 1969) and only very slight social class effects (Crandall, Katkovsky & Crandall, 1965; Solomon, Houlihan, & Parelius, 1969).

From this discussion we can see that those individuals who feel they control the reinforcements they receive will have greater assets in a transactional process involving leadership.

Intelligence and Aptitude

The contribution of intelligence to leadership appears to be small (cf., Shaw, 1971), but the review by Stogdill (1948) overshelmingly indicated that leaders are, on the average, more intelligent than nonleaders. A low positive correlation between tested intelligence and leadership behavior is indicated (Bass & Wurster, 1953a, 1953b; Hollander, 1954). If we can view aptitude as being a subset of intelligence, similar results can be expected.

That blacks, as a group, show up as deficient in abstract abilities and score below whites on most measures of academic achievement and aptitude is well documented (APA, 1969; Baugham & Dahlstrom, 1968: Colemen et al., 1966; Dreger & Miller, 1968; Epps, 1969; McFann, 1970; Pettigrew, 1964)[2]; however, the significance of this to their performance as leaders has not been investigated.

With the notable exception above, the ability of tests in general to distinguish between blacks and whites appears to be subject to numerous moderating variables; further, their ability to predict performance for either race appears to be somewhat unreliable. Evidence such as the following leads one to these conclusions:

(1) On personality-type tests, differences tend to disappear when black and white subjects are matched on such variables as intelligence (Thumin & Goldman, 1968) or socioeconomic status (Flanagan & Lewis, 1969).

(2) Aptitude differences between blacks and whites have remained even when the subjects were matched on socioeconomic status (Flanagan & Lewis, 1969).

(3) While some studies strongly confirm that verbal and mathematics test predict scholastic performance equally well for blacks and whites (Boney, 1966; Cleary, 1966; Cleary & Hilton, 1966; Munday, 1965; Stanley & Porter, 1967), other studies have yielded no clear trends in predicting job performance (Gordon, 1955; Kirkpatrick et al., 1967; Tenopyr, 1967), and thus no firm conclusions are possible (APA, 1969).

(4) Blacks have scored lower than whites on qualification tests and then have performed equally well on job sample and job knowledge tests (McFann, 1970).

(5) In some cases where blacks have been hired for certain positions for which their measured intelligence disqualified them, they have gone ahead and performed satisfactorily ("Merit for Hire", 1958).

(6) The well-known contention that blacks are handicapped on tests of spatial ability because of an environmental disadvantage has not always been supported (Osborne & Gregor, 1968).

From the above, we can conclude, as others have (Dreger & Miller, 1968), that it is still too early to assess adequately the effects of the advancement of blacks into positions calling for mental abilities of a higher order.

Miscellaneous Related Research

Much of the available research, while not falling into any of the previous categories, suggest important differences between blacks and whites which may influence transactional processes. Although two studies (Veroff et al., 1960; Vail, 1973), have shown blacks and whites to be somewhat the same on need for achievement, other studies have shown that blacks are less achievement oriented than whites (Lott & Lott,

1963; Merbaum, 1962; Mingione, 1965; Rosen, 1959). Consistent with recent studies of black consciousness and black politics where power is the central theme (Dizard, 1970; Kelman, 1970; Tomlinson, 1970), blacks have been shown to have a higher need for power (Greene & Winter, 1971; Veroff et al., 1960). Further, blacks, relative to whites, (a) generally score lower on need for dominance and autonomy (Brazziel, 1964) and self-liking (Clark, 1967), (b) are somewhat the same on need for affiliation (Veroff et al., 1960) or high in affiliation (Ferman, Kornbuk, & Miller, 1968), (c) have a higher degree of self-doubt (Deutch, 1960) and social conformity (Sistrunk, 1971), and (d) exhibit essentially the same creative talent (Doyle, 1970).

Results presented by two studies (Broom & Glenn, 1966; Cameron, 1971) weaken the notion of a separate subculture insofar as such a culture is indicated by opinion and personality differences. Indeed, based on these studies, blacks and whites appear far more similar psychologically than different. Analyzing responses to questions asked on national public opinion surveys, Broom & Glenn (1966) found, in general, that black and white differences in attitude were smaller than the differences between Southern and non-Southern whites, and between low- and high-education whites. In the other study, Cameron (1971), using various instruments, found that blacks tested the same as whites on masculinity-femininity, extraversion, ego-strength, and liking of the generalized other; higher than whites on religiosity and claimed judged liking of the generalized other; lower than whites on neuroticism and hostility; and, on a lie scale, there was a slight tendency for blacks to be more candid. Parallel

sex and developmental differences suggested to Cameron that the differential social influences are much the same and are psychologically handled the same for either race.

From these results we can conclude that blacks have stronger power orientations, are less achievement oriented, and are probably more similar to whites psychologically than different.

The studies reviewed have been based on a plethora of research designs, populations, and methodologies. Although their resluts can be considered suggestive, additional research is necessary particularly in view of the apparent change in the attitudes and behaviors of blacks since the mid-1960's. The relative scarcity of blacks in positions of leadership and influence has seriously limited knowledge in this area.

Notes for Chapter I

1. King & Bass (1970) have proposed a hierarchy of concerns about integration in organizations that is analogous to Maslow's (1954) postulation of hierarchy of needs. Their hierarchy was conceptualized as a three-tiered, truncated pyramid consisting of: entry into the organization, access to skilled jobs, and access to managerial positions.
2. While the term race will be used for convenience, no meaning is intended other than that of distinctiveness of appearance and commonality of experience; the issue of whether there are consequential differences in the genetic endowment of blacks and white will not be considered (cf., Katz, 1964).

3. The APA report (1969) offers five possible factors as to why blacks typically score below whites: clutural deprevation, anxiety induced by the testing situation, unfairness of test content, improper interpretation of test scores, and lack of content relevance.

METHOD

This section discusses the method used in the following order: (a) subjects, (b) physical environment, (c) design, (d) tasks, (e) observer training and reliability, (f) procedure, and (g) questionnaires. Additional information relevant to this study but not relevant to the present report is found in Hill & Allen (1974).

Subjects

All subjects were naval recruits attached to the Recruit Training Command of a large U. S. Naval Training Center located in the Southeastern portion of the United States. A total of 288 males, 144 black and 144 white, participated in the study. Sixty-four of these were squad leaders, 32 black and 32 white. A profile of the black and white squad leaders and members obtained from a biographical questionnaire is shown in Table 1.

All of the subjects were engaged in the seven week basic training program prescribed by the Curriculum for Recruit Training (NAVPERS 92353B, 1968). Recruit training companies were organized as shown in Figure 1. Squad leaders and occupants of other company positions are selected by the company commander (who is usually a chief or first-class petty officer) during the first few days of recruit training, usually on the basis of the recruits' vita and initial interviews. The position of squad leader was selected as the level of leadership comparison in order to obtain a large enough sample for

TABLE 1

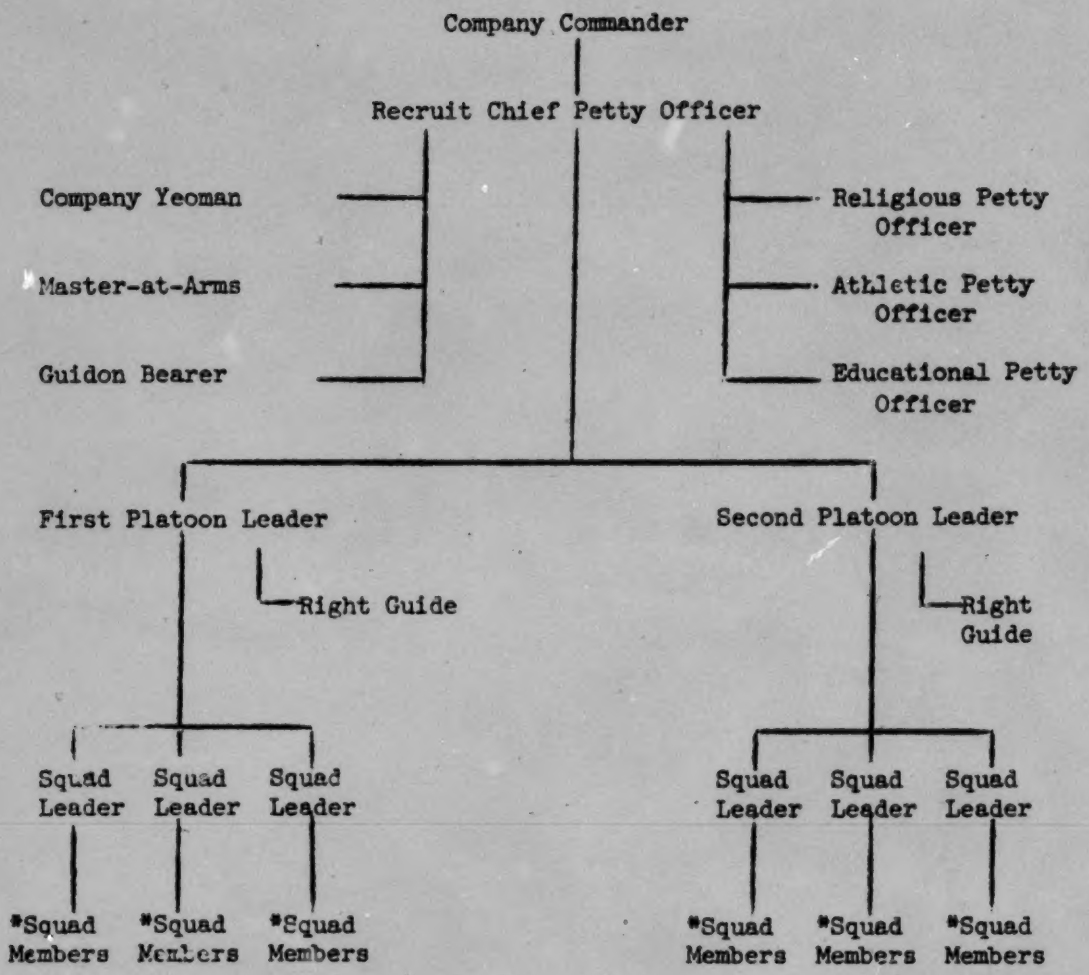
PERSONAL PROFILE OF SQUAD LEADERS AND SQUAD MEMBERS

	Squad Leaders		Squad Members	
	Black (N=32)	White (N=32)	Black (N=112)	White (N=112)
Average	19.21	19.00	19.17	18.23
Marital Status (Percent)[a]				
Married	3	13	7	4
Single	91	81	92	94
Divorced	6	3	0	1
Seperated	0	3	1	0
Average number of Dependents	.34	.37	.48	.25
Region of Birth (Percent)				
Southern	94	41	88	56
Non-Southern	6	59	13	44
Region where Raised (Percent)				
Southern	94	56	87	62
Non-Southern	6	44	13	38
Type of Community where Raised (Percent)				
Farm Community	9	16	13	11
Small Town	22	28	26	26
Medium/Large City	69	44	55	48
Moved Often	0	13	6	15
Perception of Family Income (Percent)				
Higher than Average	0	13	1	10
About Average	59	84	46	73
Less then Average	28	3	40	13
Very Much Below Average	9	0	8	3
Mostly on Welfare	3	0	5	2
Raised by (Percent)				
Mother and Father	56	91	48	78
Mother Only	31	6	36	13
Father Only	0	0	2	4
Others	13	3	14	6
Average Number of Siblings	4.50	2.78	4.87	3.41
Perception of Social Class (Percent)				
Upper Class	6	0	6	2
Middle Class	38	66	35	61
Working Class	53	34	57	37
Poverty Class	3	0	1	1
Father's Occupation (percent)				
Unskilled	13	6	20	8
Semi-skilled	44	16	34	18
Skilled	38	44	31	48
Clerical/White Collar	0	25	4	13
Professional	3	9	5	11
Unknown	3	0	6	2

[a]All percentages are rounded to the nearest whole percentage point. In some classifications the percentages do not equal 100 due to rounding.

Figure 1

Recruit Company Organization



*Note: Approximately 8 squad members up the typical squad.

statistical reliability. According to the Company Commander's Guide (CRUITRACOMORLINST 5400.1C, 1972), squad leaders during recruit training have the following as their formal duties and responsibilities:

(a) Be in charge of and responsible for the men in their squads.

(b) Assist and supervise the men in their squads in attaining high standards of personal cleanliness, military appearance, conduct, and academic achievement.

(c) Assume responsibility, under the duty platoon leader, for the performance of their squad on cleaning details.

(d) Insure that the yeoman is kept informed of personnel changes within their squads.

The selection of participants was predicated on two bases: (1) obtainins subjects as close to the end of their training as possible, and (2) reducing variability in the length of time the subjects had been in training as much as possible. These objectives were attained by selecting the sample from those companies engaged in the fifth day, fourth week, and in the first, second, and fourth days, fifth week of training. These days corresponded to the latest availability possible for the recruits. Selecting the participants in this manner assured that participants had performed in their roles long enough to have established leader-subordinate relationships. The uneven distribution and relative absence of blacks in some companies plus the rigor of the recruit training schedule precluded the use of random sampling techniques for the selection process. To achieve an unbiased sample the following procedure was used. A coordinator provided by the Commanding Officer (rather than the investigator)

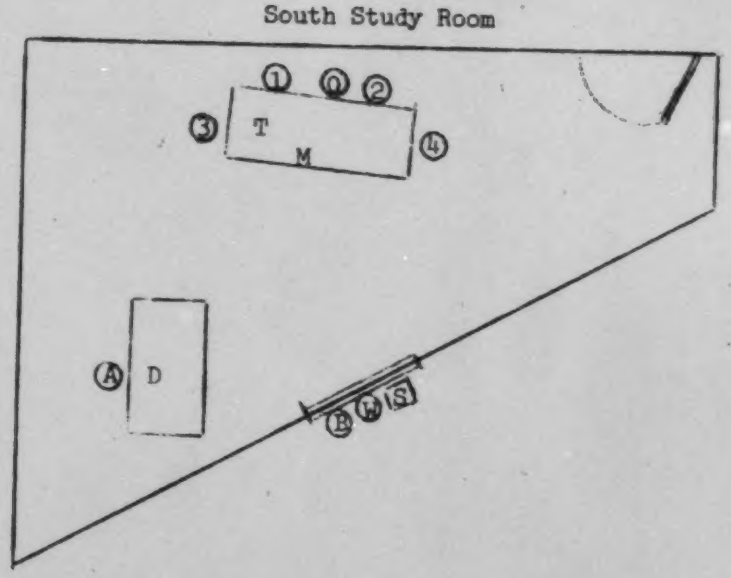
contacted commanders of appropriate companies on a daily basis to solicit their cooperation and ascertain the racial distribution among the squad leaders and members of the squads. The company commanders were told only that the squads were needed for a study concerning the problem-solving effectiveness of small groups (no mention was made of leadership or race although the racial aspects may have been guessed). Company commanders in turn decided which squads were to participate, subject only to the racial composition required by the study design. No known, consistent biasing occurred due to this selection procedure. The leaders of the groups studied were actual leaders who were appointed to their position in the customary manner; similarly, the subordinates were actual members of the squad led by the squad leader who was the group leader during the study. Selecting the participants in this manner provided a "natural experiment," that is, the phenomena under investigation were studied as they existed (Shaw, 1971).

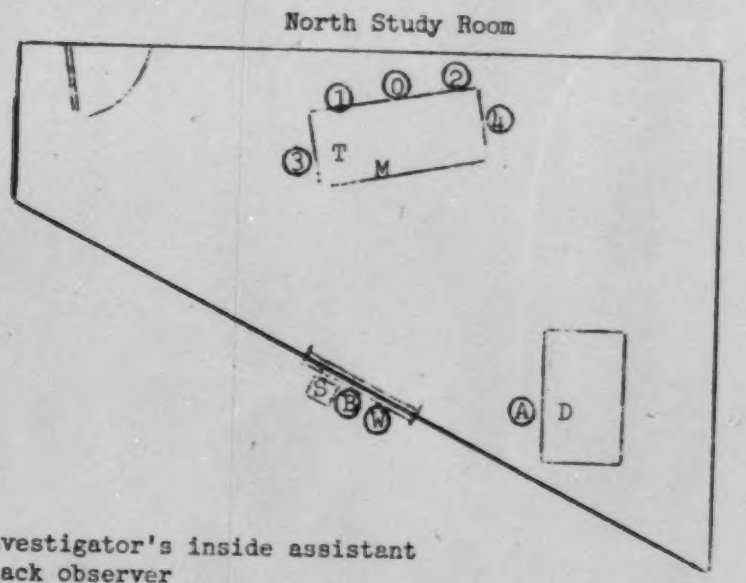
Physical Environment

The study was conducted in the Conference Facility at the U. S. Naval Training Center. Two rooms, each with a one-way window, were utilized. Trained observers were able to observe the participants without disturbing or distracting them. Figure 2 shows the physical plan of the rooms and observation stations used.

Figure 2

Physical Plan of Experiment - Rooms and Observation Stations





0 = squad leader
1 = squad member (3- and 5-man groups)
2 = squad member (3- and 5-man groups)
3 = squad member (5 man group)
4 = squad member (5 man group)

A = investigator's inside assistant
B = black observer
D = desk with stop watches
M = microphone
S = speaker/amplifier
T = table
W = white observer

Design

Eight different black and eight different white squad leaders supervised one of four types of subordinate groups: (1) one type (designated T0) consisting of one black and one white subordinate, (2) one type (designated T1) consisting of one black and three white subordinates, (3) one type (designated T2) consisting of two black and two white subordinates, and (4) one type (designated T3) consisting of three black and one white subordinates. A total of 64 leaders and 224 subordinates participated, evenly split between blacks and whites.

The study employed three independent variables: (1) leader race, (2) group size, and (3) group racial composition. Leader race was varied by having equal numbers of black and white squad leaders in charge of groups of equal size and groups of equal racial composition. Group size was varied by holding racial composition constant at 50 percent and varying the number in the subordinate group from two to four. Group racial composition was varied by holding subordinate group size constant at four and varying the number of members of each race from one to three (and thus racial composition was 25%, 50% and 75% black or white). The four-member size and 50% racial composition subordinate group is common to both the analysis of data with subordinate group size varying and the analysis of data with subordinate group racial composition varying. Otherwise, size and racial composition would be confounding variables. Basically, the result was a 2-X-4 factorial deisgn.

Measurement Instruments- Within the overall framework of the 2-X-4 design, the following were studied:

(1) interpersonal behavior (defined to be the group interaction processes),

(2) leader's style of leadership (directive versus non-directive),

(3) leader's social-emotional behavior (positive versus negative),

(4) group performance for two tasks (i.e., the time for completing each task),

(5) leader's and subordinate's duration of speech during each of the tasks,

(6) leader's and subordinate'a self-esteem,

(7) leader's satisfaction with the subordinates and the tasks,

(8) subordinate's satisfaction with the leader, the tasks, and fellow subordinates,

(9) leader's perception of his initiating structure and consideration (two dimensions of leader behavior),

(10) subordinate's perception of the leader's initiating structure and consideration,

(11) leader's and subordinate's generalized expectancies for internal versus external control,

(12) leader's general intelligence.

Those items above pertaining to group performance and leader attitudes and behavior have been previously reported (Hill & Allen, 1974). The present paper completes the reporting of the remaining data collected.

The Bales (1950) Interaction Process Analysis (IPA) was used to operationalize the group interaction processed (cf., Zdep, 1969; Richards & Jaffee, 1972; Katzell et al., 1970; Ruhe, 1972). Initiations of interaction in each of the twelve IPA catagories by all leaders and subordinates were recorded by trained observers while the tasks were being performed. Two observers were used in scoring the IPA to establish reliability for the observation process.

The time required to complete each of the tasks was used as the measure of group performance, with the assumption that the less the time needed for task accomplishment, the better the performance.

The duration of speech for each member of each group during both tasks was recorded on time-accumulating stop watches activated by the investigator's assistant. This method has been shown to be a reliable technique for recording absolute duration of speech (Bass, 1960; Jaffee & Whitaker, 1970; Jaffee, Cohen & Cherry, 1972). This measure was assumed to reflect the degree of participation by the individual group members.

Individual self-esteem of each group member was measured by two instruments: (1) the self-esteem portion (adult and student form) of the Self-Other Orientation Tasks of Ziller (1971) (designated ZSE), and (2) the Self-Esteem Scale of Rosenberg (1965) (designated RSE). Since these two measures employ different techniques, i.e., spatial abstraction and verbal self-reporting, they served as a validity check on each other.

Individual satisfaction with the subordinates, the tasks, the leader, or fellow subordinates was measured using selected scales of the Job Descriptive Index (JDI) described by Smith (1967) and Smith, Kendall, & Hulin (1969).

Assessment of the squad leader's perception of his initiating structure and consideration was accomplished through the use of the Leadership Opinion Questionnaire (LOQ), described by Fleishman (1957b). This instrument was designed to provide independent measurers of initiating structure and consideration in leadership-group situations where primary concern is in the assessment of leadership attitudes.

In a similar fashion, assessment of the leader's initiating structure and consideration by his subordinates was accomplished through the use of the Supervisory Behavior Description (SBD), described by Fleishmen (1957a). This instrument is meant to parallel the Leadership Opinion Questionnaire in scope and purpose.

Individual generalized expectancy for internal versus external control was measured by Rotter's (1966) Internal-External Control Scale (IEC). The instrument and its developmental history is documented in Rotter's (1966) monograph.

The general intelligence of the leaders was measured by the U.S. Navy Basic Test Battery (BTB) given to all recruits when they enter the recruit training program. This battery consists of four pencil-and-paper examinations: (1) the general classification test (GCT), (2) an arithmetic test (ARI), (3) a mechanical ability test (MECH), (4) a clerical ability test (CLER). The classification tests are primarily designed to measure an individual's aptitude or capability for learning, rather than his achievement. These scores were extracted from recruit records and were obtained as part of this study. The measure of general intelligence compared was the sum of the four individual scores on the GCT, ARI, MECH, and CLER tests.

Tasks

Two structured, verbal tasks were employed in this study: a knot-tying task, and ship-routing task. Both were selected because of their applicability to a situation involving Navy recruits and to assure

interaction between the leaders and subordinates in accomplishing the tasks. They differ largely in the degree to which verbal skill is required. The knot-tying task was instructional and emphasized a certain degree of spatial orientation and physical dexterity. The ship-routing task required the coordination of information provided only to the subordinates and emphasized a certain degree of mental mathematic ability.

The knot-tying task required that group members each perform satisfactorily the physical task of tying a Double Carrick Bend. This unusual knot, used in the maritime world for joining two hawsers together (a hawser is a large rope by which a ship is towed), was selected in an effort to eliminate the possibility of prior knowledge by any of the subjects, due perhaps to membership in various youth groups or an early nautical interest.

Prior to commencement of the task, the leader was given an instruction sheet, face down, displaying how to tie the knot, and each group member was given two lengths of rope. After receiving standard directions for task accomplishment from the investigator assistant, the signal to begin was given. The leader instructed the subordinates in how to tie the knot and they were asked to successfully duplicate the knot. Group members were permitted to give verbal help to each other but not physical help so that group effort and verbal interaction would be enhanced. After all subordinates had tied the knot and upon a signal from the leader, the assistant determined whether or not the knot had been tied correctly by each subordinate. The performance of the group

was measured by the total elapsed time for the instruction by the leader and the duplication of the knot by the subordinates. If the task was not completed within twenty-five minutes, the assistant was instructed to take the leader outside the room and show him how to properly tie the knot. The leader then would return and continue instructions.

The ship-routing task has been rated high on cooperation requirements, decision verifiability, and intellectual-manipulative requirements (Shaw, 1963). In this problem each group was asked to find, in the least amount of time, the shortest route for a ship to leave one port and touch at each of four other ports.

Each member was given a copy of an instruction sheet showing a diagram designed to assist in arriving at the shortest route combination. Pencils were also provided. With the same intent as Fiedler (1967), i.e., assuring that group members will have to interact to solve the problem, each subordinate received only partial information concerning the distances and availability of the routes between ports. For a five-port problem, there are ten elements of information (e.g., the distance from A to B is 150 miles by direct route). Each element was listed on a small index card. In addition, two cards with no information were included, where the total number of cards would be divisible by two and by four (leaders did not receive cards). For a three man group, each squad member was given six information cards, randomly chosen; for a five man group, three cards, also randomly choosen. Cards could not be exchanged; all information had to be transmitted verbally. A second ship-routing problem, having information and a solution exactly double

that of the first, was used whenever a second group or groups from the same company performed the task subsequent to a first group or groups with an intervening time period. This was done in case the solution to the first problem was compromised when the first group or groups returned to the barracks. Between company communication was virtually zero under regular circumstances, however, with company communication was greater because each company occupied one large room in the barracks.

After receiving standard directions for task accomplishment from the assistant, the signal to begin was given. When the group members were satisfied they had reached a correct solution, the leader signaled the assistant. The assistant then determined if the solution was correct. If the correct solution was not reached in three attempts, the task instructions were repeated and the group was allowed to continue. If the correct solution was not reached after two more attempts, the squad leader was given a copy of the available route combinations and the group was allowed to continue. The performance of the group was measured by the total elapsed time required to solve the problem.

Observer Training and Reliability

Eight men, four black and four white, were hired to assist the investigator with the study. All were trained as IPA observers. After being familiarized with the twelve IPA catagories and the applicable definitions, the observers were drilled in observing and recording the types of interactions. Mock knot-tying and ship-routing task sessions and motion pictures were used. Permanent observer teams of one black

and one white were established. Agreement within each observer team after training was 80 percent or better. Three pilot group sessions using recruits as subjects served to familiarize all concerned with the tasks, desired procedures, techniques, and methods, and to seek out and solve operational problems.

The resultant reliability for the study was obtained by calculating an intraclass correlation coefficient (Snedecor & Cochran, 1967) for each team, over both tasks and each IPA category, and weighting by the number of groups observed. A final mean interrater reliability of 71 percent resulted, with a mode equalling 74 percent.

Procedure

The number, size and composition of the groups varied depending upon the availability of the subjects from their normal routine. Two groups could be studied at one time; individual group studies were conducted during the day and at night.

In the beginning an effort was made to minimize possible racial experimenter effects (Scattler, 1970) by scheduling equal numbers of black and white supervised groups with black and white investigator assistants and balancing between the two experimental rooms but, when night sessions became necessary, this proved impossible because of the many conflicts between the schedules of the subjects and the observers. The presence of a visible black at some time during each of the sessions was designed to mitigate somewhat any racial experimenter effects.

Upon arrival at the Conference Facility the participants were escorted either to a study room or to a waiting area. As a group entered the study room they were greeted by the assistant; the squad leader was asked to sit at the middle position on one side of a rectangular table, and the squad members were asked to sit alphabetically at positions 1 and 2 or 1, 2, 3, and 4, depending group size (see Figure 2). Alphabetical seating was done to randomize the racial seating arrangement.

The purpose of the study was explained as an analysis of the problem-solving effectiveness of groups (Katzell et al., 1970). They were told that they would perform two tasks. The participants were informed that two additional observers besides the assistant giving the instructions were necessary for the analysis but had to sit outside and listen by means of a microphone on the table because of the physical arrangement of the room. The importance of completing the tasks as rapidly as possible was stressed by telling the group they were in "friendly competition" with other squads. This phrase had special meaning for the recruits. It meant that they were in competition and should perform as best they can, but no special reward would be forthcoming. To further enhance their desire to perform effectively, they were told that their company commander would be informed as to how well they compared with all the squads participating in the study. The group was told that the squad leader was selected to be in charge due to the way they are organized during recruit training. This was mentioned in an effort to enhance the leadership position of the squad leader and stress the idea that the squad leader was the one to be in charge of the group during the accomplishment of the

tasks. The same introduction was made to each group from a prepared script.

The group then received instructions for accomplishing the knot-tying task and began when the signal was given. Individual duration of speech for the task for each group member was recorded on time-accumulating stop watches. Another stop watch recorded the total time for task completion.

After completing the first task, instructions were given for accomplishing the ship-routing task. Again, individual duration of speech and total task completion time were measured.

Upon completion of the second task, the group was ushered from the study room to an unused area of the building. No conversing with a waiting group was allowed. Each subject was given a questionnaire booklet, one type for squad leaders and another type for squad members. After receiving brief instructions emphasizing the need to complete every item in the booklet, the participants were encouraged to relax and complete the questionnaire at their own pace without discussing responses with fellow recruits. Coffee and donuts (when available) were offered and smoking was permitted (this was a privilege for the recruits).

After the questionnaire was completed by the group member, it was checked for responses to every question and to look for response sets (this occurred only about four or five times). Each participant was thanked for participating in the study and cautioned not to discuss any details back in the barracks. The idea of friendly competition was again raised in an effort to solicit cooperation.

Questionnaires

Two different questionnaire booklets were prepared: one for squad leaders and one for squad members, Both leaders and subordinates completed the following: (a) a Personal Questionnaire, (b) internal versus external control scale, (c) the self-esteem instrument of Ziller, (d) the self-esteem scale by Rosenberg, and (e) the Job Descriptive Index for satisfaction with the tasks. In addition, leaders completed the Leadership Opinion Questionnaire and the selected JDI for satisfaction with subordinates while subordinates completed the Supervisory Behavior Description and selected JDI for satisfaction with the squad leader and one for satisfaction with fellow subordinates.

The Personal Questionnaire requested certain biographical data (see Table 1 for results), conducted a short 10-item general satisfaction survey and asked for squad members' feelings about the squad leader, the name of the best squad leader in the company, the rank desired during first enlistment, and the odds for making the rank. The biographical data was requested to check on the similarity of the subjects. The intent behind the other parts of this questionnaire is discussed under additional data in the analysis section of this report.

ANALYSIS

This section discusses the methods used to analyze the data collected in the field experiment (except for that previously reported) and is presented in the following order: (a) Interaction Process Analysis and Instrument Scoring, (b) Between Black and White Leaders, (c) Between Leaders of the Same Race, (d) Between Black and White Subordinates, (e) Between Groups, and (f) Additional Data.

Interaction Process Analysis and Instrument Scoring

The behavioral data collected utilizing the IPA is essentially count data possessing the characteristics of the Poisson distribution (c.f., Burford, 1968). The raw count data observed by the black and white observers for each subject in each IPA category was converted to frequency per unit time for each task and linearly transformed into whole numbers by multiplying by a factor of 10,000 and rounding to the nearest whole number. This data in turn was given a square root transformation to yield a response possessing approximately a constant variance independent of its mean (Mendenhall, 1968). The fully transformed count data for each of the two observers in each IPA category were added together (by task) to arrive at a "score". Thus, for each task, every subject had 12 scores, one for each of the IPA categories.

The various instruments were scored from the subjects' responses in accordance with the prescribed procedures.

Between Black and White Leaders

Differences in the various measures between leaders for the four group types have been previously reported using a 2-X-4 analysis of variance (ANOVA) design (Hill & Allen, 1974). The present paper examines differences in certain leader attributes without regard for group type using the Z-statistic.

Between Leaders of the Same Race

Comparisons between leaders of the same race were analyzed using the ANOVA method. To understand how these analyses were accomplished the example of black leader, equal racial composition group, is presented. The median score for each attribute (e.g., self-rated consideration) of the black leaders for Type 0 and Type 2 groups was established. A high attribute classification was given to scores above the median; low, to those below the median. Ties were broken by random selection. The performance time (for one task) associated with the black leaders, within a group type and classified as high versus low in the attribute, became the cell entries for a 2-X-2 ANOVA, where the two rows represented a high versus low classification and the two columns represented a Type 0 group versus a Type 2 group. Therefore, for black leaders, equal racial composition situation, two 2-X-2 ANOVAs were performed: (a) one for the knot-tying task and (b) one for the ship-routing task. For the black leader, equal size group situation, high and low classifications were again established and two 2-X-3 ANOVAs were run for each attribute, where the rows represented the high versus low classification and the

the columns represented Types 1, 2 and 3 groups. Thus, four ANOVAs (i.e., two 2-X-2 for the equal racial composition situation and two 2-X-3 for the equal size situation) were performed for each attribute over each leader type. Specifically, a multi-variance general linear hypothesis program BMDX63 (Dixon, 1969) was run for each ANOVA to investigate the performance of subordinate groups of equal size and equal racial composition supervised by black and white leaders, using high and low classifications of : (a) considertion (self-rated); (b) initiating structure (self-rated); (c) consideration (subordinate-rated); (d) initiating sturcture (subordinate-rated); (e) self-esteem, using both the ZSE and RSE scores; (f) internal control and (g) intelligence. The subordinate-rated scores for consideration and initiating structure were means for the ratings given by all subordinates (black and white) for the particular group type.

Between Black and White Subordinates

Within each subordinate group type, differences in the various measures between subordinates were analyzed for each leader type using the t-statistic. For every individual subordinate measure, the average black subordinate score was subtracted from the average white subordinate score to arrive at a "difference between" score for each group type and leader type. A 2-X-4 ANOVA with eight "difference between" scores per cell was then run. A t-statistic for each cell of the 2-X-4 matrix was then computed by dividing the individual cell mean by the square root of the quantity: mean square error divided by the number of observations

in the cell. This was accomplished for each of the following: (a) each IPA category for both tasks to analyze interpersonal behavior; (b) duration of speech for both tasks; (c) self-esteem, using both ZSE and RSE scores; (d) internal control; (e) satisfaction with fellow subordinates; (f) satisfaction with the leader and (g) satisfaction with work in the tasks.

Between Groups

Differences in the various measures between groups were analyzed using the ANOVA technique. Excepting performance of the group for both tasks (which was analyzed as a between leader measure and reported in Hill & Allen, 1974), a group score for each measure in question was calculated by taking the average of the measure for the particular group type. The average included both leader and subordinates. A 2-X-4 ANOVA with eight ovservations per cell was then run for each of the following: (a) each IPA category for both tasks; (b) duration of speech for both tasks and (c) satisfaction with work in the tasks.

Additional Data

The data obtained by means of the Personal Questionnaire was analyzed by various methods.

A 10-item general satisfaction survey was conducted as a part of this questionnaire. Each subject rated their own feelings toward each of the ten items on a five point Likert scale ranging from "Like Very Much" to "Dislike Very Much" with scale values from four to zero, respectively; thus, a maximum score of 40 was possible. The ten items were listed as

follows: (1) The life at boot camp, (2) What you do in your spare time, (3) Your squad, (4) Your family life, (5) Friends at boot camp, (6) Your company commander, (7) Taking part in social activities, (8) The way other recruits treat you, (9) Your life in general, and (10) A life in the Navy. Analysis of the general satisfaction survey score was accomplished in the same manner as the other individual attributes.

The squad members were asked how they felt about their squad leader to see if they would differ in their personal liking for their own leader. They rated him on a five-point Likert scale ranging from "Like Very Much" to "Dislike Very Much" with scale values from four to zero, respectively. Analysis was accomplished either through the use of the t-statistic with a pooled variance estimator or with the z-statistic, as appropriate. Comparisons were made by group type, by leader type, and by leader for both subordinate types.

All subjects were than asked to write in the blank provided the name of the squad leader whom they felt was the best in their recruit company. This was done to see if subordinates would choose their own leader more or less often than another squad leader, and to see if leaders would choose themselves more or less often then another squad leader. The response was coded as though the individual was nominating or voting for himself (if a leader) or his own squad leader; other squad leaders were given a zero response. Analysis was accomplished through the use of the X^2 test statistic (including Yates' continuity correction) for the chi-square distribution. Two-by-two contingency tables were used to provide the test statistic for comparing: (a) both subordinate types

under black leaders, (b) both subordinate types under white leaders, (c) black subordinates nominating their own leader as the best, (d) white subordinates nominating their own leader as the best, and (e) both leader types nominating themselves as the best.

Next, each subject was asked to indicate the rank he would like to reach during his first enlistment to estimate his level of aspiration. The responses were coded on a scale from one to ten, corresponding to the rank structure of the Navy from seaman recruit to officer (i.e., grades E1 to E9, plus "officer" as the tenth scale item). Finally, each subject was asked to indicate his feeling as to the odds of making the desired rank to estimate his expectancy of success. Again, a scale from one to ten was used for coding responses only this time the subjects selected gamblings odds stated as "1 chance in 10" through "10 chances in 10". Analysis for both of these questions was accomplished through the use of the z-statistic, with the following comparisons being made: (a) between leaders, (b) between subordinates, (c) black leaders to both subordinate types, (d) white leaders to both subordinate types, and (e) black subjects to white subjects.

All significance testing was standardized and performed at the .05, .01 and .001 levels of significance. If an abbreviated form is used in presenting results, the following shorthand notation will be used: (1) black leaders and white leaders will be designated BL and WL, respectively; (2) black subordinates and white subordinates will be designated as BS and WS, respectively; (3) group types 0, 1, 2 and 3 (i.e., 2-person, equal racial composition subordinate groups, and 4-person subordinate groups with 1, 2

or 3 blacks, respectively) will be designated T0, T1, T2, and T3, respectively; (4) the high/low classification within leader types will be designated HI and LO, respectively; and (5) the cells of the various two-way matrices will be designated by the row variable and group type, seperated by a slant (for example, BL/T3 means black leader, Type 3 group). Figure 3 summarized both the shorthand notation and the designs for data testing.

Figure 3

Notation and Designs for Data Testing

Design for testing data between black and white leaders:

Leader		Group Type (T0)	(T1)	(T2)	(T3)
Black	(BL)	BL/T0	BL/T1	BL/T2	BL/T3
White	(WL)	WL/T0	WL/T1	WL/T2	WL/T3

Design for testing data between leaders of the same race:

(A) Equal Size Subordinate Groups

Attribute Classification		Group Type (T1)	(T2)	(T3)
High	(HI)	HI T1	HI/T2	HI/T3
Low	(LO)	LO/T1	LO/T2	LO/T3

(B) Equal Racial Composition Subordinate Groups

Attribute Classification		Group Type (T0)	(T2)
High	(HI)	HI/T0	HI/T2
Low	(LO)	LO/T0	LO/T2

Design for testing data between black and white subordiantes:

Leader		Group Type (T0)	(T1)	(T2)	(T3)
Black	(BL)	WS-BS	WS-BS	WS-BS	WS-BS
White	(WL)	WS-BS	WS-BS	WS-BS	WS-BS

Design for testing data between groups:

Leader		Group Type (T0)	(T1)	(T2)	(T3)
Black	(BL)	BL/T0	BL/T1	BL/T2	BL/T3
White	(WL)	WL/T0	WL/T1	WL/T2	WL/T3

RESULTS

This section presents the results in the following order: (a) Differences Between Black and White Leaders, (b) Differences Between Leaders of the Same Race, (c) Differences Between Black and White Subordinates, (d) Differences Between Groups, and (e) Incidental Results.

Differences Between Black and White Leaders

Differences between black and white leaders in various leader attributes were examined and are shown in Tables 2 and 3. Further, intercorrelations between various leader attributes for leaders (i.e., black and white data combined), black leaders, and white leaders were performed using the Pearson product-moment correlation coefficient; the results are shown in Tables 4, 5, and 6.

Black leaders, as compared to white leaders were lower in internal control ($z = 3.26$, $p < .01$), self-esteem (as measured by Rosenberg's instrument) ($Z = 2.08$, $p < .05$), and intelligence ($Z = 7.51$, $p < .001$), and higher in their satisfaction with those subordinates from their squads who participated in the study ($Z = 2.41$, $p < .05$). There were no differences in initiating structure and consideration (both self- and subordinate-rated), self-esteem (as measured by Ziller's instrument), satisfaction with the tasks, and general satisfaction.

Significant correlations for leaders, black leaders, and white leaders (Tables 4, 5, and 6) were found for the following attribute combinations: general satisfaction positively with satisfaction with the tasks, knot-tying task duration of speech positively with ship-

Table 2

Means and Z Score Differences Between Black and White Leaders for Self- and Subordinate-Rated Initiating Structure and Consideration

Self-Rating (Leadership Opinion Questionnaire)		Black Leaders (N=32)	White Leaders (N=32)	Observed Z Score
Initiating Structure	Mean	47.81	48.72	0.37
	S.D.	10.58	9.25	
Consideration	Mean	57.59	57.09	0.27
	S.D.	8.06	6.50	
Average Subordinate-Rating (Supervisor Behavior Description)				
Initiating Structure	Mean	42.48	44.40	1.16
	S.D.	6.68	6.51	
Consideration	Mean	72.42	72.03	0.11
	S.D.	12.49	15.11	

Table 3

Means and Z Score Differences Between Black and White Leaders for Internal-External Control, Self-Esteem, Satisfaction-with Tasks, Satisfaction with Subordinates, General Satisfaction, and Intelligence

		Black Leaders (N=32)	White Leaders (N=32)	Observed Z Score
Internal-External Control	Mean	10.41	7.72	3.26**
	S.D.	3.35	3.26	
Self-Esteem (ZSE)	Mean	23.56	23.31	0.12
	S.D.	8.42	8.04	
Self-Esteem (RSE)	Mean	1.88	1.34	2.08*
	S.D.	1.10	0.97	
Satisfaction with Tasks	Mean	28.50	27.75	0.33
	S.D.	8.88	9.02	
Average Satisfaction with Subordinates	Mean	44.59	40.45	2.41*
	S.D.	5.57	7.97	
General Satisfaction	Mean	32.06	31.28	0.85
	S.D.	3.62	3.69	
Intelligence	Mean	178.81	216.88	7.51***
	S.D.	17.57	22.70	

* $p < .05$
** $p < .01$
*** $p < .001$

NOTE: For Internal-External Control and Self-Esteem (RSE) a lower score means greater internal control and self-esteem, respectively.

Table 4

Intercorrelations for Leader Attributes
(N = 64)

		2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.	General Satisfaction	-.01	-.19	-.13	.29*	-.12	.37***	.09	.25*	.06	.14	.17	.27*	.26*	-.04
2.	Internal-External Control		.04	.15	-.05	-.31**	-.19	-.03	.02	.08	.19	.00	-.30**	.08	-.28*
3.	Self-Esteem (ZSE)			-.27*	.07	.10	-.07	-.17	-.20	-.13	-.07	-.11	-.07	.07	-.11
4.	Self-Esteem (RSE)				.16	.00	-.02	.13	.03	.13	.05	.17	-.05	.12	-.26*
5.	Consideration (self-rated)					.12	.16	-.08	.15	-.01	-.11	.12	.05	.21*	.07
6.	Initiating Structure (self-rated)						.06	-.06	-.06	-.22*	-.25*	.14	.18	-.06	.06
7.	Satisfaction with Tasks							.13	.12	.22*	.00	.18	.01	.23*	.03
8.	Duration of Speech - Knot-tying Task								.52***	.68***	N.A.	-.07	.21*	-.23*	.08
9.	Duration of Speech - Ship-routing Task									N.A.	.31**	-.11	.10	-.01	.01
10.	Group Performance - Knot-tying										.33**	-.25*	-.02	.06	-.11
11.	Group Performance - Ship-routing											-.15	-.06	.00	-.45**
12.	Average Consideration (subordinate-rated)												.24*	.11	.06
13.	Average Initiating Structure (subordinate-rated)													-.16	.30**
14.	Average Satisfaction with Subordinates														-.16
15.	Intelligence														--

* $p < .05$
** $p < .01$
*** $p < .001$
N.A. = not applicable

NOTE: For Internal-External Control and Self-Esteem (RSE) a lower score means greater internal control and self-esteem, respectively.

Table 5

Intercorrelations for Black Leader Attributes
(N = 32)

		2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.	General Satisfaction	-.14	-.15	-.06	.25	-.26	.42**	-.01	.38*	-.03	.18	.20	.13	.21	-.09
2.	Internal-External Control		.13	.15	-.09	-.24	-.46**	-.08	-.07	-.16	.03	-.28	-.46**	.03	-.09
3.	Self-Esteem (ZSE)			-.38*	.21	.07	-.26	-.32*	-.21	-.20	-.16	-.35*	.05	.10	.09
4.	Self-Esteem (RSE)				-.04	.14	.04	.38*	.04	.12	.11	.42**	.22	.08	-.15
5.	Consideration (self-rated)					.22	.11	-.06	.26	-.08	-.07	.19	.30*	.10	.23
6.	Initiating Structure (self-rated)						.11	-.23	-.09	-.28	-.33*	.48**	.19	.04	.17
7.	Satisfaction with Tasks							.04	.24	.22	.14	.06	.01	.31*	.09
8.	Duration of Speech - Knot-Tying Task								.58***	.72***	N.A.	-.04	.20	-.12	.07
9.	Duration of Speech - Ship-Routing Task									N.A.	.19	-.07	.14	-.03	.19
10.	Group Performance - Knot-Tying										.24	-.37*	.02	.09	.07
11.	Group Performance - Ship-Routing											-.03	-.04	.00	-.35*
12.	Average Consideration (Subordinate-rated)												.33*	-.09	-.12
13.	Average Initiating Structure (subordinate-rated)													-.13	.37*
14.	Average Satisfaction with Subordinates														-.12
15.	Intelligence														--

* $p < .05$
** $p < .01$
*** $p < .001$
N.A. = not applicable

NOTE: For Internal-External Control and Self-Esteem (RSE) a lower score means greater internal control and self-esteem respectively.

Table 6

Intercorrelations for White Leader Attributes
(N = 32)

		2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.	General Satisfaction	.04	-.24	-.28	.33*	.03	.33*	.20	.10	.10	.03	.14	.45**	.26	.15
2.	Internal-External Control		-.07	-.04	-.04	-.40*	.02	.03	.10	.14	.16	.23	-.05	-.09	.04
3.	Self-Esteem (ZSE)			-.18	-.11	.15	.12	-.01	-.21	-.07	.05	.10	-.20	.04	-.33*
4.	Self-Esteem (RSE)				.43**	-.16	-.11	-.14	-.08	.00	-.27	-.06	-.29*	.03	-.11
5.	Consideration (self-rated)					-.02	.22	-.11	-.12	.06	-.25	.05	-.25	.33*	.06
6.	Initiating Structure (self-rated)						.01	.13	.00	-.13	-.10	-.17	.16	-.12	-.08
7.	Satisfaction with Tasks							.23	-.16	.22	-.28	.28	.03	.17	.22
8.	Duration of Speech - Knot-Tying Task								.52***	.71***	N.A.	-.11	.21	-.33*	.11
9.	Duration of Speech - Ship-Routing Task									N.A.	.69***	.21	.10	-.07	-.01
10.	Group Performance - Knot-Tying										.34*	-.16	.02	-.11	.15
11.	Group Performance - Ship-Routing											-.37*	.02	-.22	-.41**
12.	Average Consideration (subordinate-rated)												.17	.30*	.25
13.	Average Initiating Structure (subordinate-rated)													-.13	.20
14.	Average Satisfaction with Subordinates														.16
15.	Intelligence														—

* $p < .05$
** $p < .01$
*** $p < .001$
N.A. = not applicable

NOTE: For Internal-External Control and Self-Esteem (RSE) a lower score means greater internal control and self-esteem, respectively.

routing task duration of speech and knot-tying task performance, and ship-routing task performance negatively with intelligence.

For leaders (Table 4) the following significant correlations were found: general satisfaction positively with average satisfaction with subordinates, intelligence negatively with internal-external control and self-esteem (RSE), knot-tying task performance negatively with self-rated initiating structure and positively with satisfaction with the tasks, and knot-tying task duration of speech positively with average subordinate-rated initiating structure. It should be noted that for internal-external control and self-esteem (RSE) a lower score means greater internal control and self-esteem, respectively.

For black leaders (Table 5) the following significant correlations were found: internal-external control negatively with satisfaction with the tasks, self-esteem (ZSE) negatively with knot-tying task duration of speech and average subordinate-rated consideration, self-esteem (RSE) positively with knot-tying task duration of speech and average subordinate-rated consideration, average subordinate-rated initiating structure positively with both self-rated consideration and self-rated initiating structure. Average subordinate-rated consideration correlated negatively with self-esteem (ZSE) and positively with self-esteem (RSE) and that knot-tying task duration of speech correlated negatively with self-esteem (ZSE) and positively with self-esteem (RSE).

For white leaders (Table 6) the following significant correlations were found: self-esteem (ZSE) negatively with intelligence, self-esteem (RSE) positively with self-rated consideration and negatively with average subordinate-rated initiating structure, ship-routing task performance negatively with average subordinate-rated consideration, and average subordinate-rated consideration positively with average satisfaction with subordinates.

For both leaders and black leaders (Tables 4 and 5) the following significant correlations were found: general satisfaction positively with ship-routing duration of speech average subordinate-rated initiating structure negatively with internal-external control and positively with average subordinate-rated consideration, self-esteem (ZSE) negatively with self-esteem (RSE), self-rated initiating structure negatively with ship-routing task performance, satisfaction with the tasks positively with average satisfaction with subordinates, knot-tying task performance negatively with average subordinate-rated consideration, and average subordinate-rated iniating structure positively with intelligence.

For both leaders and white leaders (Tables 4 and 6) the following significant correlations were found: general satisfaction positively with self-rated consideration and average subordinate-rated initiating structure, internal-external control negatively with self-rated initiating structure, average satisfaction with subordinates positively with self-rated consideration and negatively with knot-tying duration of speech, and ship-routing task performance positively with ship-routing duration of speech and knot-tying task performance.

Differences Between Leaders of the Same Race

Consideration (self-rated). Differences in the performance of groups of equal size and of equal racial composition, supervised by leaders who perceive themselves high in consideration compared to those who perceive themselves as low, were examined.

No significant main effects were found for either black or white leaders; however, a significant interaction effect ($F_{1,12} = 5.09$, $p < .05$) occurred in the measure for white leaders supervising groups of equal racial composition in the performance of the ship-routing task. (See Table 7 for the cell means.) Investigation of this effect revealed that under white leaders low in self-rated consideration racially balanced dyads completed the problem faster than racially balanced tetrads ($p < .05$). This may well be due to chance.

Initiating structure (self-rated). Differences in the performance of groups of equal size and of equal racial composition, supervised by leaders who perceive themselves high in initiating structure compared to those who perceive themselves as low, were examined.

No significant main effects were found for either black or white leaders. A significant interaction effect ($F_{2,18} = 4.49$, $p < .05$) occurred for black leaders supervising groups of equal size in the performance of the ship-routing task: (a) under black leaders high in self-rated initiating structure, 25 percent black tetrads completed the problem faster than 75 percent black tetrads ($p < .05$); (b) under black leaders high in self-rated initiating structure, racially balanced tetrads completed the problem faster than 75 percent

Table 7

MEAN PERFORMANCE SCORES FOR LEADER ATTRIBUTE X GROUP TYPE INTERACTIONS FOR GROUPS OF EQUAL RACIAL COMPOSITION

		Group Type	
Attribute	Classification	(T0)	(T2)
White Leaders			
Ship-Routing Task			
Consideration (self-rated)	(HI)	1014.25	706.25
	(LO)	515.75	1236.25
Knot-Tying Task			
Initiating structure (self-rated)	(HI)	194.20	713.00
	(LO)	594.67	445.40
Black Leaders			
Knot-Tying Task			
Consideration (subordinate-rated)	(HI)	322.40	919.67
	(LO)	875.00	517.80

black tetrads ($p < .05$), and also faster than racially balanced tetrads supervised by black leaders low in self-rated initiating structure ($p < .01$) and (c) under black leaders low in self-rated initiating structure, 25 percent black tetrads completed the problem faster than racially balanced tetrads ($p < .05$). (See Table 8 for the cell means.)

Another significant interaction effect ($F_{1,12} = 5.51$, $p < .05$) occurred only for white leaders supervising groups of equal racial composition in the performance of the knot-tying task. Investigation of this effect revealed that under white leaders high in self-rated initiating structure racially balanced dyads completed the problem faster than racially balanced tetrads ($p < .05$). (See Table 7 for the cell means.)

Consideration (subordinate-rated). Differences in the performance of groups of equal size and of equal racial composition, supervised by leaders rated by their subordinates as high in consideration compared to those rated as low, were examined.

Groups of equal size performing the ship-routing task under white leaders high in consideration, as rated by their subordinates, took significantly less time ($F_{1,18} = 5.00$, $p < .05$) than those under white leaders low in this measure. Mean task performance time was 706.75 versus 1198.56 seconds. No group type main effects were found between groups of equal size and groups of equal racial composition. An interaction effect occurred ($F_{1,12} = 7.45$, $p < .05$) in this measure for groups of equal racial composition performing the knot-tying task under black leaders. Investigation of this effect revealed that under

Table 8

MEAN PERFORMANCE SCORES FOR LEADER ATTRIBUTE X GROUP TYPE INTERACTIONS FOR GROUPS OF EQUAL SIZE

Black Leaders

Ship-Routing Task

Attribute	Classification	Group Type (T1)	(T2)	(T3)
Initiating Structure (self-rated)	(HI)	637.00	929.75	2188.33
	(LO)	1166.67	2467.50	1440.00

black leaders high in subordinate-rated consideration racially balanced dyads completed the problem faster than racially balanced tetrads ($p < .05$), and also faster than racially balanced dyads supervised by black leaders low in subordinate-rated consideration ($p < .05$). (See Table 7 for the cell means.)

Initiating structure (subordinate-rated). No differences were found in the performance of groups of equal size and of equal racial composition, supervised by leaders rated by their subordinates as high in initiating structure compared to those rated as low.

Self-Esteem. No differences were found in the performance of groups of equal size and of equal racial composition, supervised by leaders high in self-esteem compared to those low in self-esteem.

Internal control. Differences in the performance of groups of equal size and of equal racial composition, supervised by leaders high in internal control compared to those low in internal control, were examined. Groups of equal size performing the knot-tying task under black leaders high in internal control took significantly longer ($F_{1,18} = 4.42$, $p < .05$) than those under black leaders low in internal control. Mean task performance time was 850.25 versus 602.25. No group type main effects were found for groups of equal size and groups of equal racial composition supervised by either black or white leaders.

Intelligence. No differences were found in the performance of groups of equal size and of equal racial composition, supervised by leaders high in intelligence compared to those low in intelligence.

Differences Between Black and White Subordinates

During the knot-tying task, black subordinates, as compared to white subordinates, exhibited behavior as follows:

(a) less giving of suggestions in racially balanced dyads under black leaders ($t = 3.24$, $p < .01$; $\bar{x}_{WS} = 27.33$, $\bar{x}_{BS} = 9.63$);

(b) less giving of opinion in racially balanced dyads under white leaders ($t = 3.74$, $p < .001$; $\bar{x}_{WS} = 7.67$, $\bar{x}_{BS} = 1.51$);

(c) less giving of information in racially balanced dyads under white leaders ($t = 2.93$, $p < .01$; $\bar{x}_{WS} = 9.66$, $\bar{x}_{BS} = 6.74$);

(d) more asking for opinion in racially balanced dyads under white leaders ($t = 3.56$, $p < .001$; $\bar{x}_{WS} = 0.66$, $\bar{x}_{BS} = 3.80$);

(e) less disagreeing in racially balanced dyads under white leaders ($t = 3.04$, $p < .01$; $\bar{x}_{WS} = 11.57$, $\bar{x}_{BS} = 4.01$);

(f) less showing of tension in racially balanced dyads under white leaders ($t = 2.07$, $p < .05$; $\bar{x}_{WS} = 4.30$, $\bar{x}_{BS} = 1.32$);

(g) less asking for information in racially balanced tetrads under white leaders ($t = 2.46$, $p < .05$; $\bar{x}_{WS} = 6.80$, $\bar{x}_{BS} = 1.58$);

(h) more showing of antagonism in 75 percent black tetrads under black leaders ($t = 2.18$, $p < .05$; $\bar{x}_{WS} = 1.59$, $\bar{x}_{BS} = 4.76$); and

(i) more giving of opinion in 75 percent black tetrads under white leaders ($t = 2.00$, $p < .05$; $\bar{x}_{WS} = 1.76$, $\bar{x}_{BS} = 5.05$).

Every t-test for differences between subordinates was accomplished using 56 degrees of freedom.

During the ship-routing task, black subordinates, as compared to white subordinates, exhibited behavior as follows:

(a) more showing of solidarity in racially balanced dyads under black leaders ($t = 2.42$, $p < .05$; $\bar{x}_{WS} = 0.00$, $\bar{x}_{BS} = 1.73$);

(b) less showing of solidarity in racially balanced dyads under white leaders ($t = 2.54$, $p < .05$; $\bar{x}_{WS} = 1.82$, $\bar{x}_{BS} = 0.00$);

(c) less asking for suggestions in racially balanced dyads under white leaders ($t = 3.09$, $p < .01$; $\bar{x}_{WS} = 3.47$, $\bar{x}_{BS} = 0.00$);

(d) more asking for suggestions in racially balanced tetrads under black leaders ($t = 2.06$, $p < .05$; $\bar{x}_{WS} = 2.08$, $\bar{x}_{BS} = 4.39$);

(e) less giving of opinion in racially balanced tetrads under white leaders ($t = 2.43$, $p < .05$; $\bar{x}_{WS} = 6.64$, $\bar{x}_{BS} = 2.48$);

(f) less giving of information in racially balanced tetrads under white leaders ($t = 2.33$, $p < .05$; $\bar{x}_{WS} = 16.90$; $\bar{x}_{BS} = 12.91$);

(g) less asking formation in racially balanced tetrads under white leaders ($t = 2.58$, $p < .05$; $\bar{x}_{WS} = 8.80$, $\bar{x}_{BS} = 2.97$);

(h) less disagreeing in racially balanced tetrads under white leaders ($t = 3.06$, $p < .01$; $\bar{x}_{WS} = 4.78$, $\bar{x}_{BS} = 1.21$);

(i) less giving of suggestions in 25 percent black tetrads under black leaders ($t = 2.90$, $p < .01$; $\bar{x}_{WS} = 11.75$;, $\bar{x}_{BS} = 2.37$);

(j) less giving of information in 25 percent black tetrads under black leaders ($t = 2.13$, $p < .05$; $\bar{x}_{WS} = 19.84$; $\bar{x}_{BS} = 16.20$);

(k) less asking for suggestions in 25 percent black tetrads under white leaders ($t = 2.04$, $p < .05$; $\bar{x}_{WS} = 3.79$, $\bar{x}_{BS} = 1.51$); and

(l) less disagreeing in 25 percent black tetrads under black leaders ($t = 2.02$, $p < .05$; $\bar{x}_{WS} = 2.36$, $\bar{x}_{BS} = 0.00$).

In their duration of speech, black subrodinates, as compared to white subordinates: (a) during the knot-tying task, spoke less in racially balanced dyads under black leaders ($t = 2.40$, $p < .05$; $\bar{x}_{WS} = 131.13$, $\bar{x}_{BS} = 62.13$) and in racially balanced tetrads under white leaders ($t = 2.42$, $p < .05$; $\bar{x}_{BS} = 175.88$, $\bar{x}_{WS} = 231.92$), and less in racially balanced dyads ($t = 3.07$, $p < .01$; $\bar{x}_{WS} = 158.00$, $\bar{x}_{BS} = 80.38$) and tetrads ($t = 2.56$, $p < .05$; $\bar{x}_{WS} = 107.94$, $\bar{x}_{BS} = 43.25$) under white leaders.

In the other measures, black subordinates, as compared to white subordinates: (a) were higher in self-esteem in racially balanced dyads under black leaders, as measured by Ziller's instrument ($t = 2.21$, $p < .05$; $\bar{x}_{WS} = 19.38$, $\bar{x}_{BS} = 26.38$); (b) were not significantly different in internal control; (c) were higher in satisfaction with fellow subordinates in racially balanced dyads under black leaders ($t = 2.12$, $p < .05$; $\bar{x}_{BS} = 38.88$, $\bar{x}_{WS} = 46.50$); (d) were higher in satisfaction with the leader in racially balanced dyads under black leaders ($t = 2.94$, $p < .01$; $\bar{x}_{WS} = 26.63$, $\bar{x}_{BS} = 36.25$) and (e) were lower in satisfaction with the work in the tasks in racially balanced dyads under white leaders ($t = 2.30$, $p < .05$; $\bar{x}_{WS} = 34.00$, $\bar{x}_{BS} = 25.50$).

Differences Between Groups

During the knot-tying task, the behavioral differences exhibited in groups supervised by black leaders as compared to those supervised by white leaders, were as follows: (a) less agreeing ($F_{1,56} = 6.62$, $p < .05$) (b) less asking for information ($F_{1,56} = 9.08$, $p < .01$), (c) less asking

for opinion ($F_{1,56} = 10.98$, $p < .01$) and (d) more showing of antagonism ($F_{1,56} = 4,13$, $p < .05$). (See Table 9 for the mean group scores for these IPA categories). Main effects of group type were found in category 4 (gives suggestion) ($F_{3,56} = 8.58$, $p < .01$). Irrespective of leader race, three-person groups, on the average, gave more suggestions when the subordinate group consisted of racially balanced dyads than when the subordinate group consisted of 25 percent black tetrads ($p < .001$), racially balanced tetrads ($p < .001$), or 75 percent black tetrads ($p < .001$). (See Table 10 for the mean group type scores for category 4.) A significant interaction effect ($F_{3,56} = 3.12$, $p < .05$) was found in category 6 (gives information): (a) three-person, white-supervised groups with racially balanced subordinate dyads gave more information on the average than five-person, white-supervised groups with both 25 percent black subordinate tetrads ($p < .05$); and racially balanced subordinate tetrads ($p < .91$); (b) three-person groups with racially balanced subordinate dyads gave less information on the average under black leaders than under white leaders ($p < .01$) and (c) five-person groups with 75 percent black subordinate tetrads gave less information on the average under black leaders than under white leaders ($p < .05$). (See Table 11 for the cell means.)

During the ship-routing task, the average behavior exhibited in groups supervised by black leaders, as compared to those supervised by white leaders, was as follows: (a) more asking for information ($F_{1,56} = 5.06$, $p < .05$) and (b) less asking for opinion ($F_{1,56} = 7.33$, $p < .01$). (See Table 9 for the mean group scores oor these IPA categories.) Main effects of group type were found in category 2 (shows tension release)

Table 9

MEAN GROUP IPA SCORES FOR LEADER RACE MAIN EFFECTS

	Groups Supervised by Black Leaders	Groups Supervised by White Leaders
Knot-Tying Task		
Category 3: Agrees	8.52	13.46
7: Asks for information	2.36	4.52
8: Asks for opinion	0.65	2.39
12: Shows antagonism	3.35	1.89
Ship-Routing Task		
Category 7: Asks for information	11.50	9.37
8: Asks for opinion	1.18	2.22

Table 10

MEAN GROUP IPA SCORES FOR GROUP TYPE MAIN EFFECTS

	Group Type			
	(T0)	(T1)	(T2)	(T3)
Knot-Tying Task				
Category 4: Gives suggestion	24.87	15.83	14.62	15.89
Ship-Routing Task				
Category 2: Shows tension release	0.77	0.40	1.78	1.95
6: Gives information	11.87	17.60	14.78	15.28
10: Disagrees	1.82	2.53	4.39	3.87
11: Shows tension	1.00	2.55	4.27	3.85

Table 11

MEAN GROUP IPA SCORES FOR LEADER RACE X GROUP TYPE INTERACTIONS

	Leader	Group Type (T0)	(T1)	(T2)	(T3)
Knot-Tying Task					
Category 6: Gives information	BL	0.94	1.88	3.33	0.92
	WL	7.81	2.66	2.07	5.25
Ship-Routing Task					
Category 1: Shows solidarity	BL	0.51	2.41	0.78	2.09
	WL	0.87	0.23	0.60	0.78

($F_{3,56} = 2.94$, $p < .05$), 6 (gives information) ($F_{3,56} = 5.18$, $p < .01$), 10 (disagrees) ($F_{3,56} = 3.84$, $p < .05$) and 11 (shows tension release) ($F_{3,56} = 5.52$, $p < .01$). Irrespective of leader race, groups: (a) showed less tension release on the average when the subordinate group was a 25 percent black tetrad than when it was a racially balanced tetrad ($p < .05$) or a 75 percent black tetrad ($p < .05$); (b) three-person groups gave less information on the average than five-person groups with 25 percent black subordinate tetrads ($p < .001$) or 75 percent black subordinate tetrads ($p < .05$); (c) three-person groups disagreed less than five-person groups having racially balanced subordinate tetrads ($p < .01$) or 75 percent black subordinate tetrads ($p < .05$), and five-person groups with 25 percent black subordinate tetrads less than those with racially balanced subordinate tetrads ($p < .05$) and (d) three-person groups showed less tension than five-person groups with both racially balanced subordinate tetrads ($p < .001$) and 75 percent black subordinate tetrads ($p < .01$) (See Table 10 for the mean group type scores for categories 2, 6, 10 and 11.) A significant interaction effect ($F_{3,56} = 3.02$, $p < .05$) was found in category 1 (shows solidarity): (a) three-person, black-supervised groups with racially balanced dyads showed less solidarity than five-person, black-supervised groups with both 25 percent black subordinate tetrads ($p < .05$) and 75 percent black subordinate tetrads ($p < .05$); (b) five-person, black-supervised groups with 25 percent black subordinate tetrads showed more solidarity than either five-person, black supervised groups with racially balanced subordinate tetrads ($p < .05$) or five-person white-supervised groups with 25 percent black subordinate tetrads ($p < .01$); (c) five-person, black supervised groups with racially balanced subordinate tetrads showed less solidarity than five-person, black-supervised groups with 75 percent black

subordinate tetrads ($p < .05$) and (d) five-person, black-supervised groups showed more solidarity than five-person, white-supervised groups with 75 percent black subordinate tetrads ($p < .05$). (See Table 11 for the cell means.)

In average duration of speech, there was no significant difference between black- and white-supervised groups performing the knot-tying task. However, black-supervised groups talked among themselves more than white-supervised groups while performing the ship-routing task ($F_{1,56} = 6.89$, $p < .05$). The mean speech duration for black-supervised groups was 203.53 seconds; for white-supervised groups, 133.04 seconds.

There were no significant differences between black- and white-supervised groups in average measures of self-esteem, internal control and satisfaction with work in the tasks.

Incidental Results

Sociometric rating of leader by subordinates. White leaders of racially balanced dyads were rated higher by white subordinates than by black subordinates ($t = 2.32$, $p < .05$, $df = 14$). The mean rating for white leaders by white subordinates was 3.50; by black subordinates, 2.50. No other significant differences were found in the comparisons by group type, by leader type, or by leader for both subordinate types.

Nomination for best squad leader. Black subordinates under black leaders choose their leader as the best squad leader in their company more often than did black subordinates under white leaders ($X^2 = 5.54$, $p < .05$, $df = 1$). Black leaders choose themselves as the best squad leader in their more often than did white leaders ($X^2 = 6.65$, $p < .05$,

df = 1). No significant differences were found between black and white subordinates under black leaders, black and white subordinates under white leaders, and white subordinates nominating their own leader regardless of leader race.

Level of aspiration. The observed means and standard deviations for level of aspiration and expectancy of success measures are shown in Table 12.

Black leaders had a higher level of aspiration than did white subordinates ($z = 2.83$, $p < .01$). No significant differences were found in comparing black leaders to white leaders, black subordinates to white subordinates, black leaders to black subordinates, white leaders to black subordinates, white leaders to white subordinates, and black subjects to white subjects.

Expectancy of success. In their expectancy of success, white subordinates were higher than black subordinates ($z = 3.31$, $p < .001$), white leaders were higher than black subordinates ($z = 4.01$, $p < .001$), and white subjects were higher than black subjects ($z = 3.79$, $p < .001$). No significant differences were found in comparing black leaders to white leaders, black leaders to black subordinates, black leaders to white subordinates, and white leaders to white subordinates.

Table 12*

OBSERVED MEANS AND STANDARD DEVIATIONS FOR
LEVEL OF ASPIRATION AND EXPECTANCY OF SUCCESS MEASURES

		Level of Aspiration		Expectancy of success	
Classification	N	$\bar{x}$	S.D.	$\bar{x}$	S.D.
Black Leaders	32	5.34	1.33	5.34	2.50
White Leaders	32	4.93	1.24	6.46	2.20
Black Subjects	144	4.90	1.66	4.76	2.67
Black Subordinates	112	4.78	1.74	4.59	2.72
White Subjects	144	4.66	1.34	5.94	2.61
White Subordinates	112	4.58	1.37	5.79	2.71

*Table arranged by rank order of level of aspiration means.

DISCUSSION

The discussion of the results reported in the current paper is necessarily less complete if no references are made to the results reported previously concerning black and white leaders' attitudes, behaviors, and effectiveness (Hill & Allen, 1974); therefore, as appropriate, these results have been incorporated into the present discussion.

Hill & Allen (1974) reported that groups supervised by white leaders performed both tasks significantly faster than groups supervised by black leaders regardless of size and racial composition. The mean time for groups supervised by black leaders to perform the knot-tying task was 677.10 seconds; for groups supervised by white leaders, 489.32 seconds. For the ship-routing task, the mean times were 1315.47 and 833.13 seconds, respectively. This suggests that white leaders engaged in leadership behavior that facilitated the accomplishment of the tasks within the framework specified by this study or that the subordinates worked harder at accomplishing the tasks for the white leaders (see, e. g., Katz, Roberts & Robinson, 1965). Of course, the fact that white leaders were significantly higher in intelligency (Table 3) may be a contributing factor since this suggests a greater cognitive multiplexity, but this is discounted somewhat by the fact that intelligency correlated negatively with ship-routing task performance for both black and white leaders (Tables 4 and 6). Even though all subjects were of equal status as naval recruits, the squad leaders did have some slight degree of additional status because they were one level higher in the hierarchy of the recruit company command structure and were responsible for assuring that their subordinates accomplished certain

functions. Having blacks in the higher status position of leader (particularly over whites) is, at this time, relatively incongruous with society at large (cf., Berger, Cohen & Zelditch, 1966, Cohen, 1972), thus this condition may have been perceived as being "status incongruent" and may have influended the performance of groups supervised by black leaders. Further, since the black leaders had such a high level of aspiration (Table 12) they may have engaged in behaviors (e.g., assertiveness) considered by white subordinates (and possibly black subordinates as well) as even more incongruent. Status incongruence and group heterogeneity have been shown to interfere with group problem-solving effectiveness because some of the efforts of group members are diverted from task demands to attempts by the members to establish status congruency (Ziller, 1972) or to attempts by the members to cope with interactive pressures generated by group composition effects (Haythorn, 1968). Another explanation may lie in the fact that while the white subjects were born and raised more less equally in the Southern and non-Southern regions of the U.S. nearly all of the black subjects were born and raised in the South. Whether the general degree of racial prejudice is greater in the South can be questioned, but, since there does exist a clear historical definition of the status of blacks relative to whites, it seems reasonable to conclude that working with whites is stressful for Southern blacks (cf., Katz & Cohen, 1962.) The stress of the biracial situation could also account for the performance deficiency of the black supervised groups. In addition, experimental stress (Back & Bogdonoff, 1967), which has been shown to be particularly acute for blacks in biracial situations (Back et al., 1969; Katz & Greenbaum,

1963), may have been a factor. Subjects who for any reason may have been especially overwhelmed by the intrinsically stressful features of the experimental situation may not have behaved in the same way that other subjects did. Further, since the black leaders in this study knew they were being observed and evaluated somehow, they may even have felt that they were proving not only their own personal adequacy but the adequacy of blacks in general (cf., Back et al, 1969). If so, this would be an additional stress-inducing element acting to the detriment of the black leaders.

Under both black and white leaders, groups of equal size took progressively longer to perform each task as the proportion of black subordinates increased from 25 to 75 percent. For the knot-tying task the times were 626.38, 668.50 and 883.88 seconds under black leaders; and 474.88, 545.75 and 592.25 for white leaders. Groups supervised by black leaders displayed on the average less agreeing, less asking for information, less asking for opinion and more antagonism than did groups supervised by white leaders; all of these categories suggest behavior that hinders performance. For the ship-routing task the times were 835.63, 1698.63 and 1720.63 under black leaders; and 805.38, 971.25 and 990.88 for white leaders. In this task, groups supervised by black leaders displayed, on the average, less asking for opinion but more asking for information, and, in addition, were significantly greater in average speech duration than groups supervised by white leaders. This last result could probably be predicted because of the greater emphasis placed on verbal interaction and "rapping" skills by blacks (Kochman, 1969) combined with the information sharing nature of the task; engaging in more dialogue was natural for the black subordinates as they found themselves

in a progressively more comfortable social situation. This can be interpreted as detracting from task demands and therefore reducing performance. Comparative poor performance on the second task (ship-routing) could have resulted from the frustration and difficulty on the first task (knot-tying). Additionally, since blacks in the 50's and 60's had been shown to be more failure avoidant (Lefcourt & Ladwig, 1965a) and lack interest in achievement-related pursuits (Rose, 1956), these qualities may have combined to produce the longer performance times for groups having a greater percentage of blacks, however, this explanation is considered rather tenuous at best. When blacks were in majority, they may also have felt more inclined to show antagonism and assert themselves as subordinates - particularly under black leaders.

Comparing black and white leaders' use of the IPA categories indicated race, group and interaction effects (Hill & Allen, 1974). Table 13 was developed to summarize the IPA behavior differences between leaders.) The major finding is that white leaders were clearly more active in interpersonal behavior. In <u>every</u> instance of a significant difference between leader types for both tasks, black leaders displayed less of the behavior in question than did white leaders. Although white leaders gave and asked for more opinion during the ship-routing task, the results were more pronounced during the knot-tying task where white leaders exhibited more activity in five of the twelve categories: showing solidarity, giving suggestions, asking for information and opinions, and disagreeing. These results showing less expressive behavior suggest inhibition on the part of the black leaders.

TABLE 13

SUMMARY OF OBSERVED IPA DIFFERENCES
BETWEEN BLACK AND WHITE LEADERS

IPA Category	Knot-Tying Task	Ship-Routing Task
1. Shows solidarity	(WL > BL)**	(BL/T0 < BL/T1)** (BL/T1 > BL/T2)** (BL/T1 > BL/T3)* (BL/T1 > WL/T1)**
2. Shows tension release	NS	(T1 < T2)** (T1 < T3)*
3. Agrees	NS	NS
4. Gives suggestion	(WL > BL)**	NS
5. Gives opion	NS	(WL > BL)*
6. Gives information	(BL/T0 < BL/T2)* (BL/T2 > BL/T3)** (WL/T0 < WL/T3)* (WL/T1 < WL/T3)* (BL/T3 < WL/T3)***	NS
7. Asks for information	(WL > BL)**	NS
8. Asks for opinion	(WL > BL)*	(WL > BL)*
9. Asks for suggestion	NS	NS
10. Disagrees	(WL > BL)*	(BL/T0 < BL/T3)** (BL/T1 < BL/T3)* (WL/T1 < WL/T2)* (BL/T0 < WL/T0)**
11. Shows tension	NS	(T0 < T2)** (T0 < T3)** (T1 < T2)*
12. Shows antagonism	NS	(T0 < T2)* (T0 < T3)* (T1 < T2)*

*p < .05
**p < .01
***p < .001
NS = no significant difference

BL = black leader
WL = white leader
T0 = subordinate group with one black and one white member
T1 = subordinate group with one black and three white members
T2 = subordinate group with two black and two white members
T3 = subordinate group with three black and one white members

Additional analyses can contribute further to the explanation of the above finding. The parametric tecniques employed to analyze the IPA data provide valuable informtion concerning the magnitude of differences but in some cases fail to provide information involving patterns of differences. In an effort to seek out important patterns of behavior displayed through IPA differences, Table 14 was developed. In each case, the number of times that mean IPA scores of black subjects exceeded those of whites was used as the criterion for counting the differences; this table also permits the determination of effects due to group size and racial composition.[1]

Four important patterns of behavior emerge from Table 14. First black leaders are shown in still another way to be less expressive in their behavior than white leaders during both tasks. This is evidenced by the significantly lower frequency of black leaders exceeding whites in all IPA categories combined during both tasks. No effects due to group size or composition occur. Second, black subordinates appear to have been less expressive only during the ship-routing task, since no differences were found for the knot-tying task. For neither task did an effect on subordinate behavior due to group size occur, but one due to the change in racial composition is very much in evidence. This leads to the third important pattern of behavior: both black and white subordinates appear to be more inclined to talk when there are more of their own race. For both tasks,

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[1]To check for an effect due to change in size we compare the data shown for group types 0 and 2 (i.e., those of equal composition but of different size); to check for an effect due to a chenge in racial composition we compare the data shown for group types 1, 2 and 3 (i.e., those of equal size but of varying racial composition.

TABLE 14

FREQUENCY COMPARISON OF DIFFERENCES IN OBSERVED IPA BEHAVIOR BETWEEN LEADERS, SUBORDINATES AND GOUUPS BY TASK TYPE AND BY GROUP TYPE

Task	Comparison	Total IPA Behavior	IPA Behavior by Group Type			
			Group Type 0	Group Type 1	Group Type 2	Group Type 3
Knot-Tying	Leaders	(8/48)***	(2/12)*	(1/12)**	(3/12)	(2/12)*
	Subordinates	(44/94)	(7/23)[1]	(8/24)	(11/24)	(18/23)
	Groups	(11/48)***	(3/12)	(1/12)**	(4/12)	(3/12)
Ship-Routing	Leaders	(16/47)*	(3/12)	(8/11)	(2/12)	(3/12)
	Subordinates	(38/96)[1]	(10/24)	(4/24)**	(8/24)	(16/24)
	Groups	(24/48)	(5/12)	(4/12)	(7/12)	(8/12)

[1] $p < .10$
* $p < .05$
** $p < .01$
*** $p < .001$

NOTES: (a) All tests used the X2 test statistic for the chi-square distribution with df=1, Yates' continuity correction included.

(b) The numerator of the fraction in the parenthesis is the number of times black leaders or subordinates displayed more behavior than whites, or, in the case of groups, the number of times the black-led group average was more than the white-led group average.

(c) The denominator is the number of times there was a difference between the two classes being compared.

(d) The expected numerator is one-half the denominator.

the number of instances of black subordinate behavior exceeding white subordinate behavior increases as the number of black subordinates increases (with group size held constant). For the knot-tying task, 75 percent black subordinate tetrad, the number of instances where black subordinate behavior exceeds that of white subordinates is significantly greater than chance; conversely, for the ship-routing task, 25 percent black subordinate tetrad, black subordinate behavior exceeded that of white subordinates significantly less than chance. Increasing the number of subordinates in the opposite race in subordinate groups of equal size, therefore, appears to have had an inhibiting effect. The last important inference that can be drawn from Table 14 is that the black-led groups engaged in the knot-tying task displayed significantly less IPA behavior, on the average, than did white-led groups. This is evidenced by significantly fewer instances of average IPA behavior under black leaders exceeding average IPA behavior under white leaders during the knot-tying task.

Looking more closely at differences between subordinates also indicates behavioral differences. Where black subordinates displayed significantly less behavior, 12 of 16 instances occurred under white leaders, suggestive of an effect due to leader race. However, chi-square tests of the number of instances where black subordinates displayed less behavior than whites, under each leader type and for both tasks, reveal no significant differences in frequency.

The finding of more inhibited behavior on the part of black leaders and subordinates, as compared to white leaders and subordinates, is in keeping with earlier research (Katz & Benjamin, 1960; Katz, Goldston &

Benjamin, 1958; Cohen, 1972) in which blacks displayed social inhibition relative to white partners in cooperative problem-solving situations, even when matched on intelligency and ability. This result may be expalined in terms of status characteristic theory (Berger, Cohen, & Selditch, 1966) which suggests that the relations between the races will be biased in the same direction as in the outer society (i.e., whites will be more active and influential than blacks). Along the same lines, Cohen (1972) calls this interracial interaction disability, the condition where both races have built-in expectations for superior performance and greater participation on the part of whites. (This attitude might also account for the performance dificiencies of the black-supervised groups, as previously discussed.) Again recognizing the geographic origins of the subjects, the social stress experienced by the black subjects may have been a factor contributing to the inhibition they displayed, although social inhibition by blacks has also been observed among students at a Northern University (Katz & Benjamin, 1960; Katz, Goldston & Benjamin, 1958). Nevertheless, we see that the black sub rdinates in this study displayed more behavior as their number increased in the subordinate tetrads, which may indicate that they were responding to a more comfortable social situation.

Both black and white leaders appear to have experienced more difficulty supervising the larger subordinate groups. Leaders, regardless of race, showed more tension and antagonism during the ship-routing problem with racially balanced tetrads than with racially balanced dyads (Table 13). A similar effect was seen when IPA categories 10, 11, and 12 were collapsed into what has been defined as negative social-emotional behavior (Bales, 1950)

An increase in this type of behavior occurred in both the ship-routing and knot-tying tasks (these results from Hill & Allen, 1974). This suggests that both black and white leaders behaved in a more negative manner because the size of the group increased. This finding is in keeping with previous research indicating that smaller groups inhibit the expression of disagreements and dissatisfactions more than larger groups (Thomas & Fink, 1963). Another explanation is that the smaller groups may have been easier to direct toward task completion. Because the leaders in this study were relatively inexperienced, one can readily understand how they might react with more negative behavior in their attempts to control and direct the efforts of the larger group toward task completion, particularly since they were told that they were in competition with other groups.

Increasing the relative number of blacks in the subordinate groups also appears to have caused supervision difficulties for both black and white leaders. During the ship-routing problem, leaders also showed more tension and antagonism when supervising 75 percent black tetrads compared to racially balanced dyads and when supervising racially balanced tetrads compared to 25 percent black tetrads (Table 13). Although this does not replicate for the knot-tying task, this still suggests that both black and white leaders found it neceasary to behave in a more negative manner because the number of black subordinates increased. It also suggests an interaction with task requirements. Poor performance of the group in the knot-tying task may have prompted the leaders to react more negatively in the following ship-routing task. Whether or not this was necessarily due to the increased behavior on the part of black subordinates as their number increased in the tetrads is not clear.

The fact that black leaders were significantly lower in internal control at first appears to do no more than confirm substantial prior research (cf., Lefcourt, 1966; Rotter, 1966); however, contrary to what would be expected from earlier research, no significant differences were found between black and white subordinates when compared by leader and group type, although in seven out of eight possible comparisons black subordinates did score lower in internal control. Relating internal control to performance, we see that equal size groups supervised by black leaders high in internal control took significantly longer to perform the knot-tying task than did similar groups with black leaders low in internal control. This is a reversal of what one might expect, since a person high in internal control has been shown to be effective in attempts to influence others (Lao, 1970). One explanation, in keeping with previous research, may be that black leaders high in internal control did indeed vigorously attempt to direct their subordinates toward task completion (more direction was called for during the knot-tying task compared to the ship-routing task, since the former was instructional in nature whereas the latter was more information sharing in nature); therefore, the black leaders may have been perceived as engaging in status incongruent behavior, while the white leaders were not so perceived, and some of the group efforts may have been diverted from the task and directed toward establishing status congruence. Indeed, we do see from Tables 4 and 5 that internal control correlated negatively with the average initiating structure perceived by subordinates for leaders and black leaders. This indicates that leaders and black leaders who were perceived as higher in initiating structure were also higher in internal control.

From Table 2 we see that there were no differences between black and white leaders in both their own and their subordinates' perception of the initiating structure and consideration leader behavior dimensions. Correlating these measures with task performance showed knot-tying task performance correlating negatively with average subordinate-rated consideration for leaders (Table 4) and black leaders (Table 5) but not for white leaders (Table 6), and ship-routing task performance correlating negatively with the same measure for white leaders but not for leaders or black leaders. Also, knot-tying task performance correlated negatively with leader-rated initiating structure for leaders but not for black or white leaders considered separately, and ship-routing task performance correlated negatively with the same measure for leaders and black leaders but not for white leaders. In general, the performance results for both tasks, using both leader- and subordinate-rated measures of initiating structure and consideration, were inconclusive. The only situation where a significant difference occurred was for equal-sized groups performing the ship-routing problem under white leaders, where the task was performed significantly faster by those groups supervised by a leader high in subordinate-rated consideration. Since a significant difference was not found in the identical situation using the leader-rated measure, this particular result indicates some support for the work of Lowin, Hrapchak & Kavanagh (1969) who suggest that it is better to use subordinate-rated measures of initiating structure and consideration. Of course, this may also be a chance finding since there were no other differences. The interactions found in these leadership measures offer no consistent support for initiating

structure or consideration as reliable predictors of group performance. Overall then, these leadership dimensions, as rated by both leaders and subordinates, do not appear to reliably account for either black or white leader behavior as related to group performance (cf., Anderson, 1966; Korman, 1966; Lowin, Hrapchak & Kavanagh, 1969). One possible explanation of the lack of a relationship between initiating structure and performance is offered by Lowin (1968). He lists four intervening variables which affect this relationship: (a) task complexity, (b) subordinate expertise, (c) supervisor expertise and (d) the need for coordination in the interest of overall effectiveness. In the present study, the tasks were relatively elementary, the subordinates were of approximately equal skill, the leaders were no more competent in the tasks than the subordinates, and there was not an extremely pressing need for group cooperation (i.e., since this was an experimental and not a real, on-the-job situation), thus these variables may not have allowed initiating structure to affect performance.

The comparisons on both tasks relative to leader self-esteem (both measures) and intelligency do not indicate any relationship between these attributes and performance for groups of equal size or of equal racial composition, although intelligency did correlate negatively with ship-routing task performance for both black and white leaders.

Size and composition effects were examined post hoc by checking the frequency with which the groups under consideration performed the tasks either faster or slower compared to chance. The number of times racially balanced tetrads took longer than racially balanced dyads to perform both tasks under black and white leaders was not significantly different from

chance (chi-square test); therefore, we can say that group size effects were not operative. Also, differential patterns for the performance times of equal-sized groups under both black and white leaders were not in evidence.

By and large the results of contrasting the performance of groups supervised by leaders high in the various attributes with that of groups supervised by leaders low in the same attribute were inconclusive for both groups of equal size and of equal racial composition. No special relationships emerged for either black or white leaders. Perhaps the best statement that can be made is that the results were equally inconclusive for both black and white leaders.

Group performance for the two tasks did correlate with other measures besides those mentioned thus far. Knot-tying task performance correlated positively with satisfaction with task accomplishment for leaders (Table 4) combined but this relationship did not hold when black and white leaders were considered separately; it also correlated positively with leaders' speech duration during this task for both black and white leaders (Tables 5 and 6), a result not unexpected since this task was instructional in nature. Ship-routing task performance correlated positively with both speech duration during this task and knot-tying task performance for leaders combined and white leaders, but not for black leaders considered separately. Also, the more effective leaders on one task tended to be the effective leaders on the other task. However, since speech duration on each task correlated positively for both black and white leaders it appears that the more effective leaders, regardless of race and task,

engaged in more conversation, a logical result for leaders of groups performing structured tasks.

Intercorrelations with respect to the general satisfaction survey appear to be consistent. Leaders (Table 4) who were more generally satisfied also were more satisfied, on the average, with their subordinates; also, both black and white leaders (Tables 5 and 6) who were more generally satisfied were more satisfied with the tasks. Self-rated consideration was positively related to general satisfaction (as was average subordinate-rated initiating structure) for leaders combined and white leaders, but this relationship did not hold for black leaders considered separately. Leaders combined and black leaders (but not white leaders) who were more generally satisfied also tended to talk more during the ship-routing task.

With regard to intelligency as measured by the Basic Test Battery we see that leaders (Table 4) who were higher in intelligency also were higher in internal control and self-esteem (for the Rosenberg measure), although white leaders (Table 6) were found to be lower in self-esteem on the Ziller instrument. Leaders combined and black leaders (but not white leaders) (Tables 4 and 5) who were higher in intelligence were also perceived by their subordinates on the average, as being higher in initiating structure. Leaders (data combined) thus perceived by their subordinates also tended to be higher in speech duration during the knot-tying task (Table 4).

Intercorrelations for the leaders with respect to attitudes and perceived leader behavior appear to suggest differences as a function of race

in that there is not complete consistency among them for both black and white leaders. For black leaders (Table 5) the following relationships emerged: (a) those higher in internal control tended to be higher in satisfaction with task accomplishment, (b) those higher in self-esteem (on both measures) tended to speak less during the knot-tying and were perceived by their subordinates as being lower in consideration, and (c) those perceived by their subordinates as higher in initiating structure also perceived themselves as higher in both consideration and initiating structure. For white leaders (Table 6) the following relationships emerged: (a) those higher in self-esteem (on the Rosenberg measure) perceived themselves as lower in consideration but were perceived by their subordinates as higher in initiating structure, and (b) those perceived as higher in consideration by their subordinates tended to have lower performance groups under them during the ship-routing task but were higher in their satisfaction with their subordinates. For leader data combined and black leaders (but not for white leaders considered separately) the following relationships emerged: (a) those perceived by their subordinates as higher in initiating structure were also higher in internal control and consideration as perceived by the same subordinates, (b) those higher in self-esteem as measured by the Ziller instrument were also higher in self-esteem as measured by the Rosenberg instrument (a fact that increases our confidence in both measures), (c) those who perceived themselves as higher in initiating structure tended to have lower performing groups under them during the ship-routing task, and (d) those who were higher in their satisfaction with the tasks were also higher in their satisfactions with their

subordinates. For leader data combined and white leaders (but not for black leaders considered separately) the following relationships emerged: (a) those higher in general satisfaction also perceived themselves as higher in consideration and were perceived by their subordinates as higher in initiating structure (these relationships were discussed previously under general satisfaction), (b) those higher in internal control also perceived themselves as higher in initiating structure, and (c) those higher in their satisfaction with their subordinates tended to be higher in their perception of their own consideration but they also tended to talk less during the knot-tying task. The above results do not reflect any apparent illogical inconsistencies; indeed, several important relationships are suggested but these should be considered as suggestive only and should be pursued as the main focus of future research(e.g., the relationship of consideration and initiating structure to group performance and the relevant situational variables affecting the relationship, especially those relating to race).

One result reported in the present report that appears inconsistent with the previous report on this research (Hill & Allen, 1974) is the finding that black leaders were lower in self-esteem when measured by the Rosenberg instrument (Table 3). In the previous report this self-esteem measure for leaders was analyzed as a 2-X-4 analysis of variance where the cell entries were the self-esteem scores for the leaders of the particular group types. That analysis yielded an F ratio of 3.97 which is almost significant at the .05 level of confidence (the significant F for testing was 4.02). In the present report this finding was significant only a

small amount above the .05 level. Thus, the conservative observation would be that this may well be a chance observation, particularly in light of the lack of a significant difference on the other self-esteem measure (Table 3) and the significant correlation between the two self-esteem measures for leaders combined and black leaders (Tables 4 & 5). The research literature on self-esteem with regard to race does not clearly indicate probable results. Although most of the early literature indicates that blacks almost inevitably develop feelings of low self-esteem (Ausubel & Ausubel, 1963; Gernard, 1958; Jefferson, 1957), much of the recent literature indicates that black self-esteem is no different than white self-esteem (Douglas, 1970; McElroy, 1971; White, 1971).

The results of comparing black and white subordinates' use of the individual IPA categories while working on the two problems indicate several significant differences in subordinate behavior as a function of leader race and group type; however, no direct consistent relationships emerged. Although black subordinates showed more solidarity in racially balanced dyads under black leaders during the ship-routing task and white subordinates more under white leaders in the same situation, there is a noticable lack of significant differences in both tasks in the three categories classified as positive social-emotional behavior. From this it appears that black and white subordinates were more or less equal in their display of positive behavior during the study.

The conclusion that working with whites is potentially stressful for Southern blacks may account for the finding that black subordinates in racially balanced dyads under white leaders rated their leader

significantly lower than did the white subordinates when asked for an indication of their feelings of like or dislike. If the black subordinates were indeed experiencing stress they may have felt themselves in an uncomfortable social situation and responded accordingly, although this finding did not replicate in the other group situations. Of course, the finding may have occurred due to chance. This is highly probable in this particular instance since several other comparisons were made and no other differences were found.

The reason for black subordinates under black leaders choosing their leader as the best in their company more often than black subordinates under white subordinates in unclear because leader and race may be confounding variables in this situation. Were the black leaders chosen for their leadership qualities, or were they chosen because they were of the same race? In other biracial situations, blacks have indicated a preference for one another as future working companions (Katz & Benjamin, 1960). It may be that the black subordinates felt the need to display racial solidarity, particularly in view of the fact that there were so few black leaders overall.

The fact that black leaders choose themselves as the best squad leader in their company more often than white leaders raises several issues of causality. This finding may be a manifestation of a highly positive self-image on the part of the black leaders. It might also be interpreted as a kind of defensive behavior in that the black leaders may have felt the need to show a high level of confidence in their leadership role. Of course, a statement to the contrary concerning self-image could

be said of the white leaders, although previous research would not suggest a lowered self-image on the part of whites in biracial situations. Whether or not the white leaders felt the need to be modest and indicate someone other than themselves as the best is unknown. Perhaps the most plausible reason is that the black leaders experienced an enhanced self-image due to being chosen as leaders during recruit training. Indeed, from Table 12 we see that the mean scores on the aspiration measure were higher for leaders than for subordinates. This suggests that both black and white leaders experienced some form of self-image enhancement. This last effect seems to have been especially influential on the black leaders compared to the white leaders. Not only was the black leaders' mean score greater than that of the white leaders, they were also significantly higher than white subordinates in their level of aspiration, even though their expectancy of achieving this level was not significantly different from that of white leaders or white subordinates. Assuming that aspirations are a manifestion of the achievement motive (Poussaint and Atkinson, 1968) we see that black leaders were probably higher in their desire for achievement than were the white subordinates who were not singled out during recruit training to be leaders, but they may have evaluated their chances of success in terms of society as a whole. Recent research confirms earlier findings that blacks do not expect their occupational aspirations to be realized in contemporary American society (Fromkin & Sherwood, 1974, p. 76). As Dreger & Miller (1968) have pointed out, the evidence accumulates that, when measured by direct questions, the level of aspiration of blacks may be higher than those of comparable whites.

The important incidental finding concerns the expectation of future achievement by the black leaders. The confidency in achieving the rank they desired seems to have been substantially enhanced by their being choosen as leaders (and probably also by any success experiences attained in the leader role) since in every other black-white comparison the whites felt that they has a higher probability of success. This suggests an important qualitative effect. Indeed, we see that the white leaders were similarly influenced since their mean score was the highest obtained. The white leaders appear to have the most confidency in beliefs about chances for success. Thus, the enhancing effect appears to be operative regardless of leader race. Whether or not this qualitative effect would be evident for black leaders in charge of racially homogeneous groups would require additional research.

SUMMARY

The principle purpose of this report is to complete the examination of data gathered in a field experiment investigating racially heterogeneous groups of varying size and racial composition under the supervision of black and white leaders. Overall, the findings reported here indicate little evidence of substantial differences between black and white leaders as they perform in leadership roles. There were no differences in consideration and initiating structure as perceived by both the leaders and their subordinates; the importance of this is clear when one considers that these dimensions of leader behavior are frequently used to account for a leader's behavior and its effects. Differences between black and

white leaders in locus of control, satisfaction with subordinates, and intelligence corroborate substantial earlier research; the difference in self-esteem as measured by Rosenberg's instrument is less clear since earlier research tends to be equivocal. The white supervised groups in this study outperformed the black supervised groups, and white leaders were seen as more frequently using some of the Bales IPA categories (these results previously reported in Hill & Allen, 1974). The results of relating group performance to leader attributes which were dichotomized into high versus low categories were inconclusive for both black and white leaders supervising groups of equal size and of equal racial composition.

The results of comparing black and white subordinates' use of the individual IPA categories suggest differences in subordinate behavior as a function of leader race and group type; however, no direct, consistent relationships emerged.

For the knot-tying task groups supervised by black leaders displayed, on the average, less agreeing, less asking for information, less asking for opinion, and more antagonism than did groups supervised by white leaders. For the ship-routing task groups supervised by black leaders displayed, on the average, less asking for opinion but more asking for information, and were greater in average speech duration than groups supervised by white leaders.

Although no difference was found between black and white subordinates in their sociometric rating of leaders without regard to leader race, white subordinates in racially balanced dyads indicated a greater liking for their white leader than did black subordinates. Black subordinates under

black leaders chose their leader as the best squad leader in their company more often than did white subordinates under black leaders. White leaders chose themselves as the best squad leader in their company less often than did black leaders. Black and white leaders were not different in their desire for achievement and their expectancy of success. Black leaders indicated a higher level of aspiration than did white subordinates. In their expectancy of success, white leaders and subordinates were higher than black subordinates, and white subjects were higher than black subjects.

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